News about

B. F. Goodrich Chemical *raw materials*

Special Purpose Materials That Help Rubber Compounders

THE materials listed here supplement the well-known Hycar nitrile rubbers and offer many advantages in developing and improving compounds for specific applications. Check them over, and write for technical information on your requirements. We'll help you select the material best suited to your needs. Please address Dept. HA-3, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, O. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Hycar 4021	***Polyacrylic acid ester***—Excellent high temperature air and oil resistance. Used where air and hot oil resistance at temperatures above 300° F. are needed; ozone, light and flex resistant applications.
Hycar 1312	***A liquid nitrile copolymer***—Excellent non-migrating, non-extractable, non-volatile polymeric-type plasticizer for rubber and plastic compounds. Useful in nitrile rubber sponge, friction compounds and for tackifying in roll building operations; in vinyl plastisol compounding; in modification of liquid phenolics and phenolic solutions.
Hycar 1411	***High acrylonitrile copolymer***—finely divided, non-soluble powder. Used in modification of phenolic and melamine resins; blends with other Hycar rubbers for improved smoothness of extrusions and calendered goods.
Hycar 2001	***Styrene copolymer***—Oil soluble, with high electrical properties. Used in electrical applications; binder for grinding and cut-off wheels; special adhesives.
Good-rite RESIN 50	***High styrene copolymer***—white, free-flowing powder. Reinforcing and processing aid for use with GR-S and other rubbers. Used in shoe soles, floor tiling, extrusions, rolls, golf ball covers and other high Durometer applications.
Good-rite VULTROL	***Retarder activator***—free-flowing flake. For crude, GR-S and nitrile rubber stocks. Prevents scorching at processing temperatures the year 'round. Safe processing with no sacrifice of rate of cure. Beneficial to heavy-loaded or highly-accelerated compounds; particularly effective with high abrasion furnace blacks.

B. F. Goodrich Chemical Company

A Division of The B. F. Goodrich Company

Hycar Reg U S Pat Off
American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors

Introducing-

A NEW PRODUCTION CHAMP

CYCOLAC

A *New* HIGH-IMPACT THERMOPLASTIC RESIN

CYCOLAC is a single uniform resin which is permanently thermoplastic, permitting fast molding, calendering and extruding, and re-use of trim and cutting scrap. Also economical to form from press-polished sheets by vacuum, air-pressure, or mechanical methods over inexpensive molds of wood, plaster, aluminum, etc.

CYCOLAC is free from nerve or shrinkage; with a high in impact-resistance and heat-distortion temperature, plus a low brittle point. Resistant to many oils, solvents and corrosive chemicals.

Very light — Sp. Gr. 1.01 . . . dimensionally stable . . . soluble in selected solvents, for potential coatings applications. Readily injection-molded, extruded and calendered.

GET THE FACTS — Write TODAY for TECHNICAL LITERATURE

Some of the 1,001 End Products Made with CYCOLAC

- Chemical & Industrial Piping
- Molded Pipe & Industrial Fittings
- Corrosion-proof Valve Bodies
- Signs — Display Racks
- Desk Tops
- Profile Extrusions
- Beverage Dispensers
- Tote Boxes
- Carpet-Sweeper Housing & Wheels
- Kitchen Accessories
- Post-Formed-Sheet Furniture
- Rain Gutters
- Appliance & Tool Handles
- Bottle Closures

Marbon

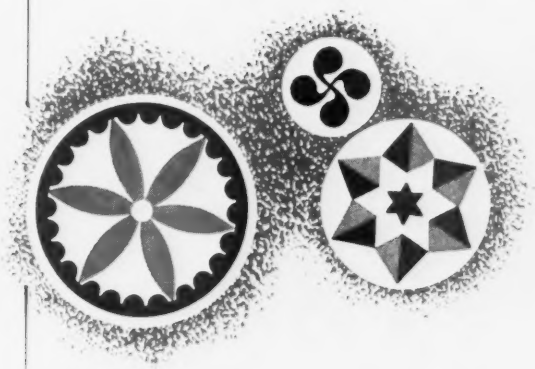
MARBON CORP.

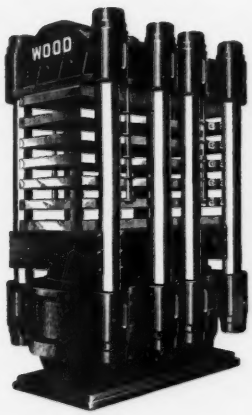
GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

MARBON . . . Precision Resins for Precision-Made Products

Do you believe in hex signs?





In Pennsylvania Dutch country, the hex sign on the barn is mighty important. The farmer has confidence in its power to protect against evil. In the business world, customers believe in, and rely on, the name of the manufacturer. For instance—to people in metalworking, woodworking, rubber and plastics, the R. D. Wood name is a sign of real value in hydraulic presses . . . good presses that turn a profit for them year after year. To you as a buying influence, the 150-year-old Wood name can mean a lot, too. Economy and efficiency in production, for one thing. If you like, we'll send you a descriptive catalog.

IN RUBBER AND PLASTICS, THE PAYOFF'S AT AN R. D. WOOD PRESS LIKE THIS ONE!

This 1,327-ton multiple-opening hydraulic press is used for the manufacture of molded brake lining and similar products. Can be furnished in various sizes and capacities to meet production needs. R. D. Wood presses are made for use in many industries. Ask for catalog, and for engineering aid—both yours without obligation.

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Representatives in Principal Cities

MAKERS OF HYDRAULIC PRESSES AND VALVES

FIRE HYDRANTS

CAST-IRON PIPE

GATE VALVES

GAS PRODUCERS

ACCUMULATORS

NOW-HOSE IN A HURRY

with new, dry-blending PLIOVIC DB80V

MOLDERS and extruders! Here is a new resin specifically designed to let you turn out quality hose—or any molded or extruded item—in a hurry. It's PLIOVIC DB80V – a tailor-made, polyvinyl chloride that has all the properties a good, dry-blending resin should have.

Free-flowing characteristics. Adequate heat stability. Ready moldability and extrudability. Maximum physical properties. All these requirements have been built into PLIOVIC DB80V to permit economical compounding of quality products on conventional equipment.

Key to the excellent dry-blending properties of PLIOVIC DB80V is its ready and regulated absorption of plasticizer. This, in turn, results from careful control of particle size and distribution. Particles of PLIOVIC DB80V are dry, free-flowing and of irregular surface. This structure encourages absorption. Their narrow size range makes this absorption uniform. The result is fast, efficient compounding.

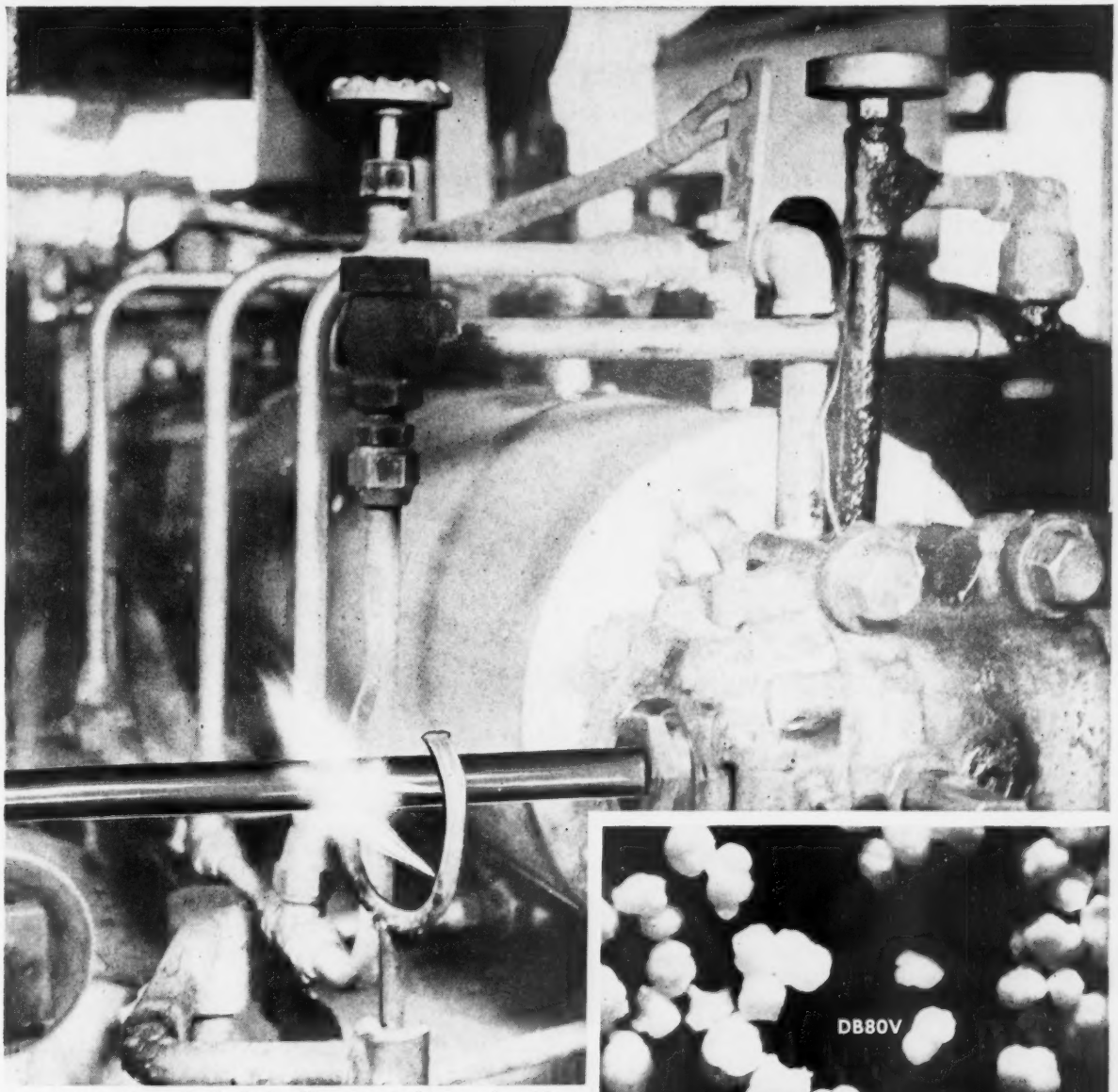
Only moderate heat is needed to mix PLIOVIC DB80V compounds. Thus, only a brief heat history is developed. This adds up to greater stability during the more severe conditions of forming and the useful service life of the end product.

If you haven't tried PLIOVIC DB80V, you should. And you can, simply by writing for samples and technical help to:
Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

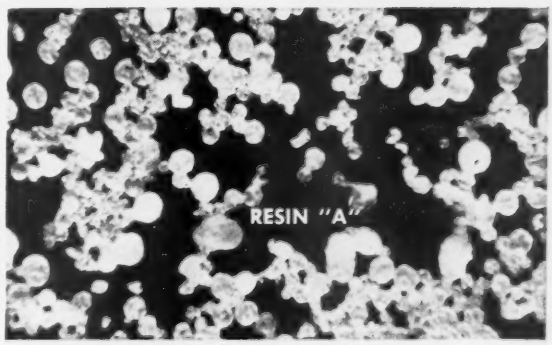
Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry



Fast processing hose, that's fast selling too, is best made with PLIOVIC DB80V—thanks to its unique dry blending and extruding characteristics and its top physical properties.

PHYSICAL PROPERTIES OF PLIOVIC DB80V	
Composition	100% Polyvinyl Chloride
Color	White
Nature of Particle	Dry, free-flowing
Size Distribution of Particles	100% thru 40 mesh
	80-100% thru 80 mesh
	0-15% thru 200 mesh
Intrinsic Viscosity	0.80 Av.
Specific Gravity	1.40 Av.
Bulk Density	38 lbs./cu. ft. av.



Excellent dry blending of PLIOVIC DB80V results from the type and size of its particles. These photomicrographs illustrate the differences between particles of PLIOVIC DB80V and those of a conventional, general purpose resin.

CHEMICAL PROGRESS .. at GENERAL MILLS

Fatty Acid Trend in Rubber Making ☆☆☆☆☆ General Mills Aliphats for Sponge Rubber ☆☆☆☆☆ Many Types Available

Have you tried using a mixture of fatty acids in the manufacture of sponge rubber products? An interesting trend has developed toward the use of special fatty acid mixtures. Experience suggests that a mixture of General Mills Aliphat 44-B (approximately 75 percent) and Aliphat 6-C (approximately 25 percent) will give you superior results.

Today's modern technology enables you to use those mixtures best suited for your specific needs.

The combination of Aliphats 44-B and 6-C, for instance, gives excellent blow in the manufacture of sponge rubber . . . leaving the rubber with a springy texture, small, even pores, and a moderate skin thickness. Aliphats 44-B and 6-C help generate the gas that blows up the rubber, help accelerate vulcanizing, help disperse the pigments within the rubber mass, and help to plasticize the rubber.

Not only will General Mills Aliphats help you produce a good sponge rubber by performing the above functions, but also, you will save money.

If you would like technical information on General Mills Aliphats (fatty acids), just mail the coupon below.

Sponge rubber being manufactured at Durkee-Atwood, Minneapolis. Fatty Acids aid vulcanizing, blow, and lubrication in rubber-making process.

In addition to Aliphats 44-B and 6-C, General Mills has specialized fatty acids for the various rubber manufacturers. For sponge rubber there are Aliphats 44-B, 6-C and 33-B; for foam rubber Aliphats 44-A and 44-B; for dense rubber Aliphats 6-R and 7-R. For technical data, please mail the coupon below.

☆☆☆☆☆

The motto of General Mills research laboratories is "Progress Thru Research." We like to think this motto explains much of the success of General Mills as a vigorous and expanding manufacturer of foods, feeds, household appliances, and chemical products for industry.

General Mills has developed and improved a wide variety of industrial fatty acids. These General Mills Aliphats have a record of successful performance in many industries—rubber, paper, mining, lubricants, waxes and polishes, cosmetics, protective coating, soaps, insecticides, detergents, and others.

If you do not have technical information on the fatty acids available from General Mills, just mail the coupon below.

There is an ALIPHAT for your specific need.

☆☆☆☆☆

Controlled distillation processes used by General Mills guarantee that manufacturers will receive fatty acids of high quality and uniformity.

General Mills Aliphat 44-B, for example, is an unsaturated fatty acid produced from tall oil. Its outstanding properties permit the use of Aliphat 44-B in a number of industrial applications—liquid and jell type soaps, latex foam rubber, synthetic oils, ore flotation, special polishes, and carbon paper. These and other uses illustrate the adaptability of Aliphat 44-B. It seems to have a possible application wherever unsaturated acids with a low titer are required.

Aliphat 6-C, on the other hand, is a saturated acid of excellent quality. It has good stability and will perform effectively and economically wherever lighter color is not required. This Aliphat has a saturated acid ratio of approximately 60 per cent palmitic acid and 40 per cent stearic acid. Besides its recommended use in sponge rubber, Aliphat 6-C has proved very useful in metallic soaps, buffing compounds, and emulsifiers.

☆☆☆☆☆

General Mills

CHEMICAL DIVISION

KANKAKEE, ILLINOIS

Please send me technical information on General Mills Aliphats (fatty acids).

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

TYPE OF RUBBER_____

progress thru research

RUBBER FABRICATORS NEED ACCURATE CUTTING DIES

For Cutting

Rubber, Neoprene, Plastics, etc.
Sheeting, Foam, Sponge, Cellular,
Cured & Uncured

Gang Dies Our Specialty

- Accuracy to close Tolerances
- Durability
- Genuine Understanding of the problems of rubber goods manufacturers

MALLET HANDLE DIES

PURPOSE — For those who have no machinery and do not wish to purchase any. For Cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from bolts or not.

SERVICE—One to three days.

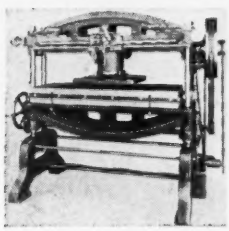
STEEL RULE CUTTING DIES

Used on Die Cutting Press, Printing Press or Power Press

PURPOSE — Especially suited for cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE—Low in cost. Suitable for long production runs. It is necessary to cut from rectangular sheets which are fed into the press.

SERVICE—One day service.



STEEL RULE CLICKER DIES

Use On Clicker Machine or Dinker Press

PURPOSE—For Cutting Rubber, Neoprene, Plastics, etc.

ADVANTAGE — More reasonably priced than the all steel dies. Recommended for small and medium quantities where cost of an all steel die is not warranted.

SERVICE—One day service.

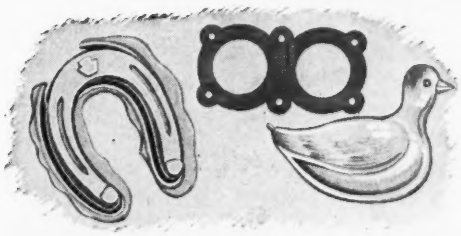
ALL STEEL DIES

Use On Clicker Machine or Beam Press or Power Press

PURPOSE—For Cutting—Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from rolls without first cutting into sheets.

SERVICE—One to three day service on dies.



DIE CUTTING SERVICE

PURPOSE—For those who prefer to have their cutting done by others.

ADVANTAGE—We can die cut your product for you on our own presses rapidly and economically at a low "per thousand" cost.

SERVICE—One to three days.

Dies for cutting
Gaskets, flashing from molded parts, rubber soles, foam and sponge for furniture padding, inflated toys, clothing and footwear, etc.

SAME DAY SERVICE

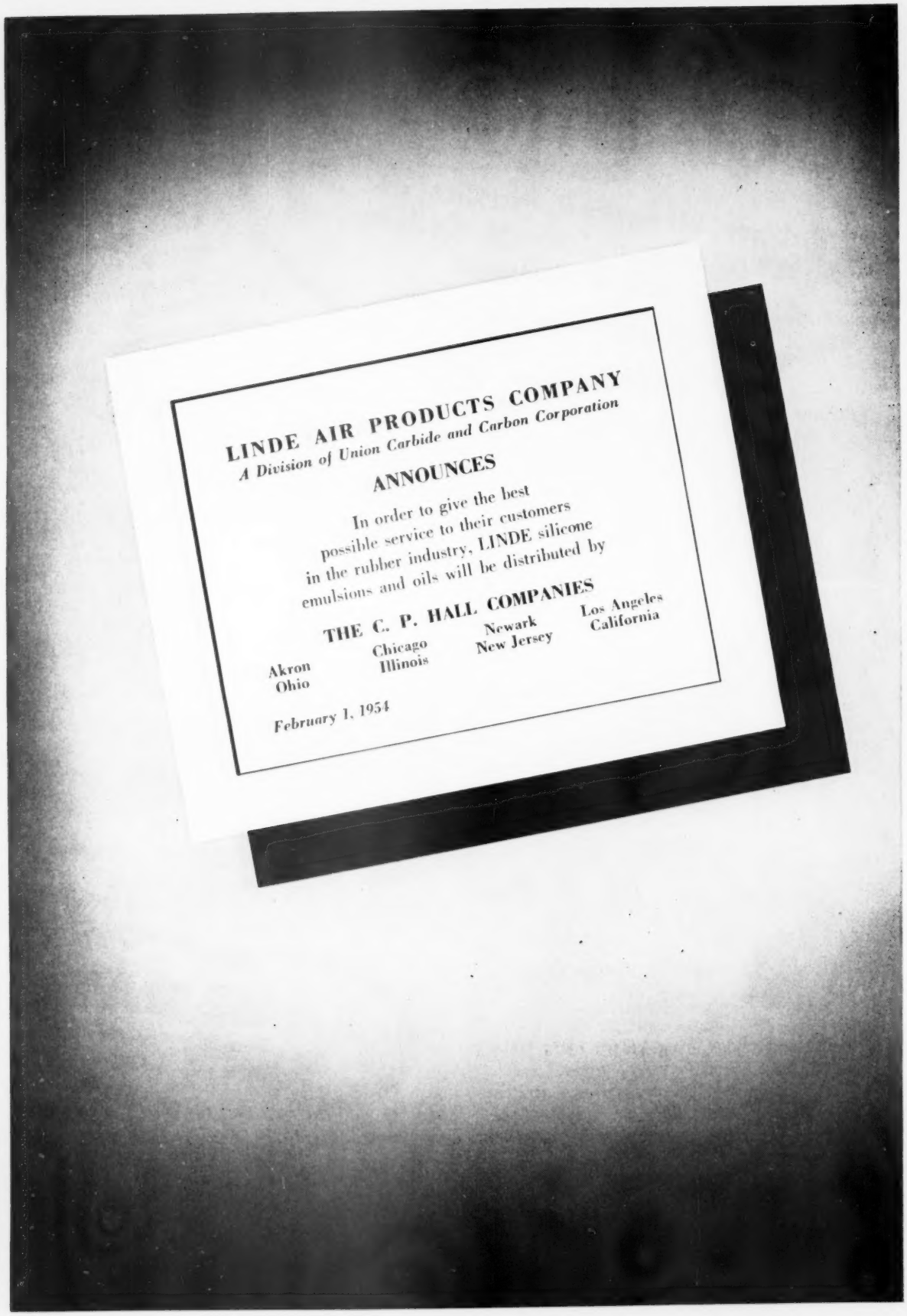
ACCURATE

STEEL RULE DIE MANUFACTURERS

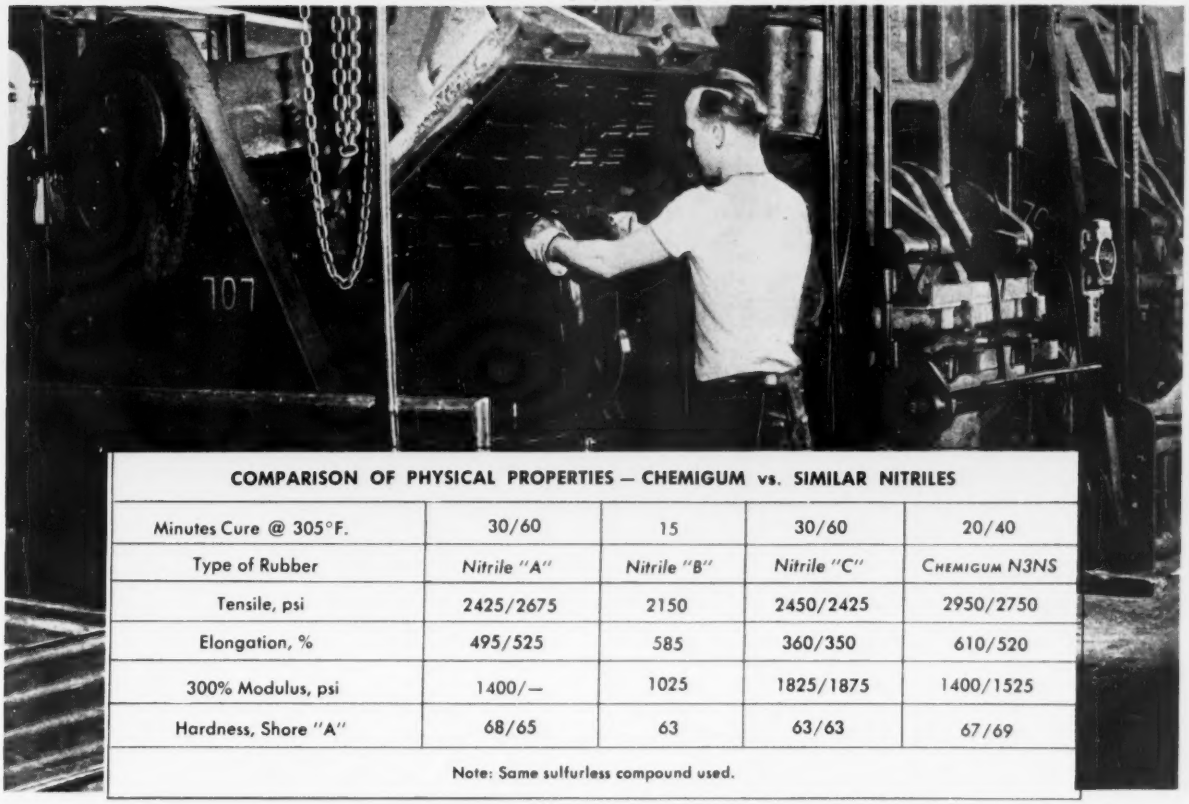
24-28 West 21st Street, New York 10, N. Y. CHelsea 2-0860-1

Subsidiaries: American Fabricators; Interstate Die Cutting Co., Inc.

Intelligent Service to the Rubber Goods Industry for Over 23 Years


LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
ANNOUNCES
In order to give the best
possible service to their customers
in the rubber industry, LINDE silicone
emulsions and oils will be distributed by
THE C. P. HALL COMPANIES
Akron
Ohio
Chicago
Illinois
Newark
New Jersey
Los Angeles
California
February 1, 1954

OIL- AND HEAT-RESISTANT PARTS are made faster and better with CHEMIGUM. Easier processing, quicker curing and superior physical properties (see table) are the reasons.



COMPARISON OF PHYSICAL PROPERTIES — CHEMIGUM vs. SIMILAR NITRILES				
Minutes Cure @ 305°F.	30/60	15	30/60	20/40
Type of Rubber	*Nitrile "A"*	*Nitrile "B"*	*Nitrile "C"*	*CHEMIGUM N3NS*
Tensile, psi	2425/2675	2150	2450/2425	2950/2750
Elongation, %	495/525	585	360/350	610/520
300% Modulus, psi	1400/—	1025	1825/1875	1400/1525
Hardness, Shore "A"	68/65	63	63/63	67/69
Note: Same sulfurless compound used.				

FASTER SULFURLESS CURES

using less acceleration come with CHEMIGUM

And you get better physical properties, too.

Just look at the table above. A basic oil-resistant compound was used. Sulfur was omitted to obtain high heat-resistance. All the other rubbers required more acceleration. Nitrile "C" needed considerably more, plus some sulfur for proper cure. Yet the CHEMIGUM compound cured much faster and gave higher tensile, elongation and hardness.

Moreover its heat-resistance was equal to or better than that of the others. So was its solvent-resistance. And the CHEMIGUM processed much easier to give you still another good reason for trying this use-proved nitrile with its new, light color and smaller bale.

A postcard will bring you plenty of samples and technical help. Simply send it to:

Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry

Thiokol®

PLASTICIZER TP-90B

Yields Maximum Low Temperature Flexibility and Maintains Excellent Physical Properties

"Thiokol" Plasticizer TP-90 B is an efficient low temperature plasticizer. Even at high concentrations it does not appreciably impair the physical properties of the compounds in which it is used.

"Thiokol" Plasticizer TP-90 B is highly compatible with natural rubber, Neoprene nitrile-type rubbers and GR-S. It imparts excellent low temperature flexibility to these elastomers and maintans high resilience over a wide temperature range.

The following results illustrate how "Thiokol" TP-90 B yields excellent low temperature flexibilities while still maintaining the physical properties:

	Natural Rubber	Neoprene GN	Hycar OR-15	Paracril-B	GR-S
TP-90B, p. h. r.	30	20	30	30	30
Cure, min. /° F.	30/310	45/300	30/310	30/310	30/310
Tensile, p. s. i.	2200	2600	2380	2250	1500
Elongation, %	530	410	300	350	380
Shore Durometer	42	68	70	61	45
Low Temperature Flexibility**	**–95°F**	**–70°F**	**–70°F**	**–80°F**	**–95°F**

**Determined according to a modification of ASTM method D 1043-49T. The temperatures shown are the values at which the absolute torsional moduli are 10,000 p. s. i. Although the specimens were still quite flexible, G10,000 was arbitrarily chosen as the stiffening point.

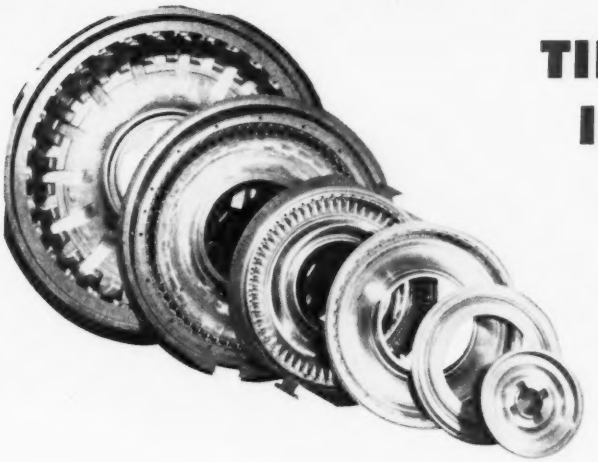
For technical information and samples, write:

This information is believed to be accurate. However, no warranty is expressed or implied regarding the accuracy of these data, or the use of this product.

Thiokol Chemical Corporation

784 NORTH CLINTON AVENUE • TRENTON 7, NEW JERSEY

In Canada: Naugatuck Chemicals Division, Dominion Rubber Company, Elmira, Ontario



TIRE MOLD MAKING IS OUR ONE JOB *at the* ATHENS MACHINE COMPANY

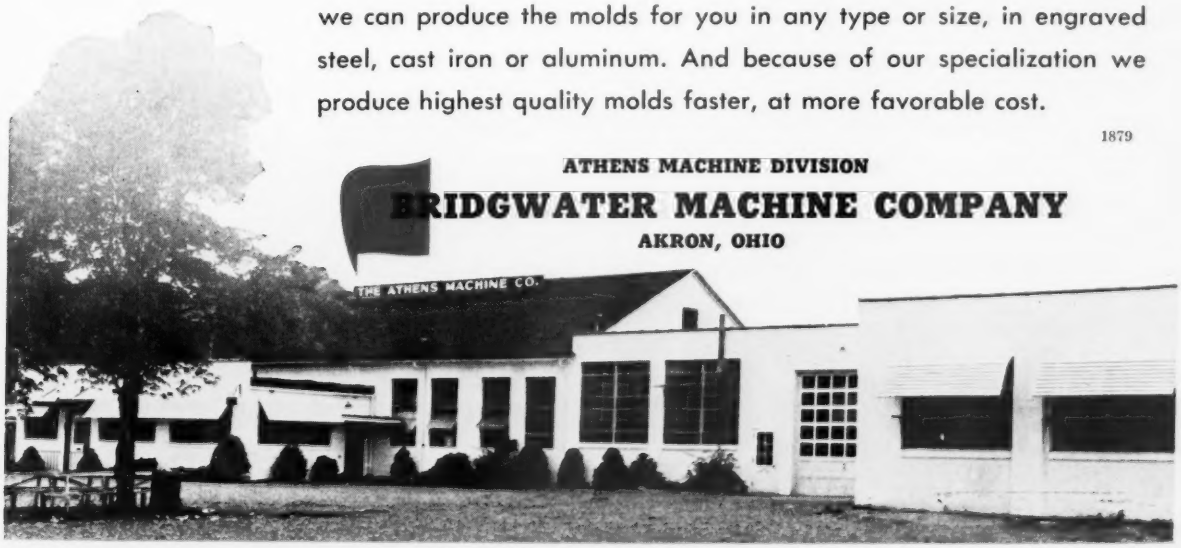
In Athens, Ohio, the Athens Machine Division of Bridgwater Machine Co. is equipped to give the automotive tire industry finer mold making service than it has ever known.

We've always been able to give immediate and individual attention to our customers' orders . . . we made that our obligation to the tire industry when we began making molds nearly half a century ago. In upholding it, we not only kept abreast of tire development, but took the lead in metal working and machine tool advancement, as applied to tire mold making. Today, at Athens, tire mold manufacturing is our only production. That's why every year finds us able to serve your mold requirements even better than ever.

Specialization at Athens permits more and better machine tools, uninterrupted "flow" along our production lines, and the development of unsurpassed skills among our craftsmen. Specialized and automatic machine tools of our own design help keep your mold costs down by eliminating many otherwise necessary cutting, grinding and finishing operations.

Whatever your mold requirements might be . . . passenger tires . . . off-the-road treads . . . something "different" in tires for special applications . . . at Athens we can produce the molds for you in any type or size, in engraved steel, cast iron or aluminum. And because of our specialization we produce highest quality molds faster, at more favorable cost.

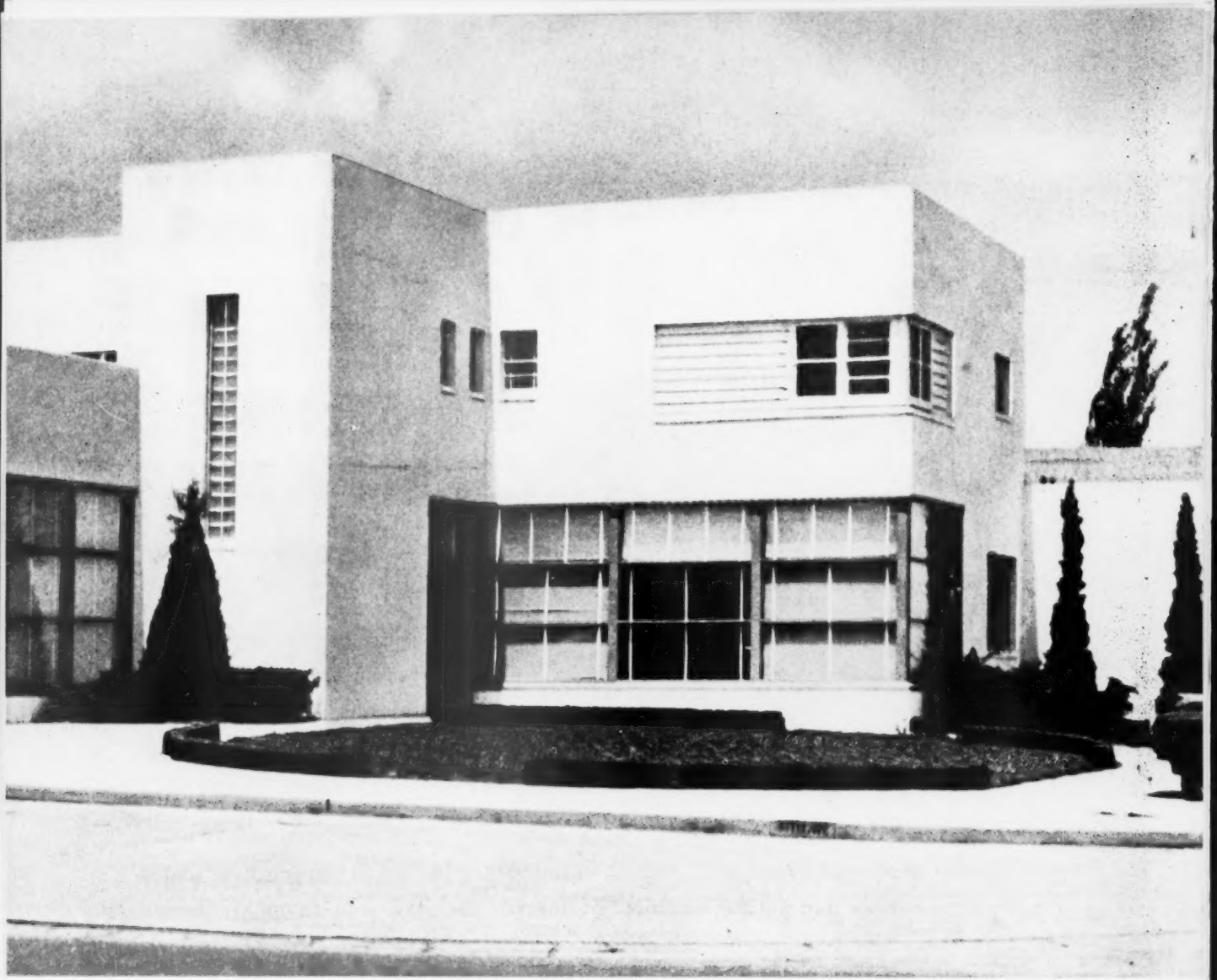
1879



ATHENS MACHINE DIVISION

BRIDGWATER MACHINE COMPANY

AKRON, OHIO



WITCO-CONTINENTAL CARBON BLACK LABORATORY, 1400 West 10th Avenue, Amarillo, Texas.

Finding Answers to problems in Carbon Black

Pictured here is WITCO-CONTINENTAL's Carbon Black Technical Service and Research Laboratory – one of the most modern and complete laboratories in the carbon black field. Second to none in the quality of its staff and facilities, it puts the latest research and scientific testing equipment to work on *your* problems . . . whenever you say the word.

WITCO

WITCO CHEMICAL COMPANY

CONTINENTAL CARBON COMPANY

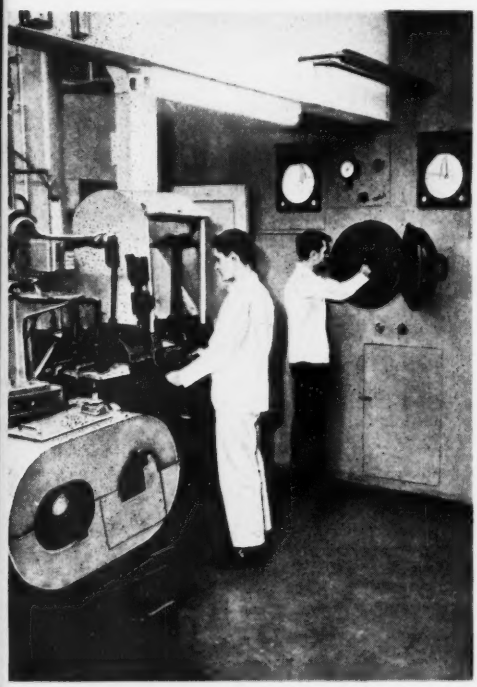
260 Madison Avenue, New York 16, N.Y.

Akron • Amarillo • Los Angeles • Boston • Chicago • Houston
Cleveland • San Francisco • London and Manchester, England

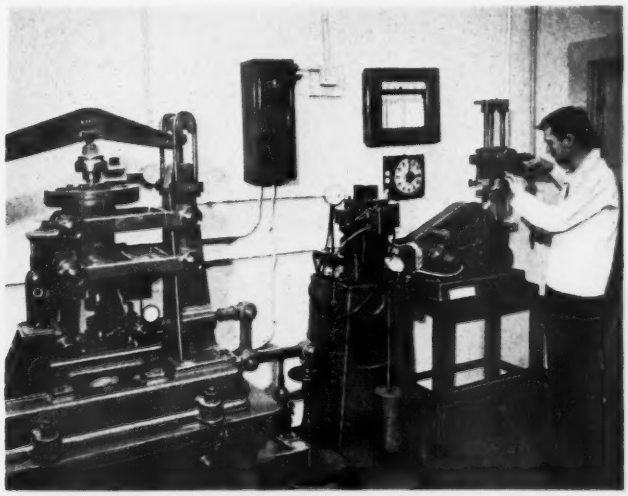
Royal tuber (one-half size) for evaluation of special extruding compounds.

Scott tester for determination of tensile strength of rubber compounds.

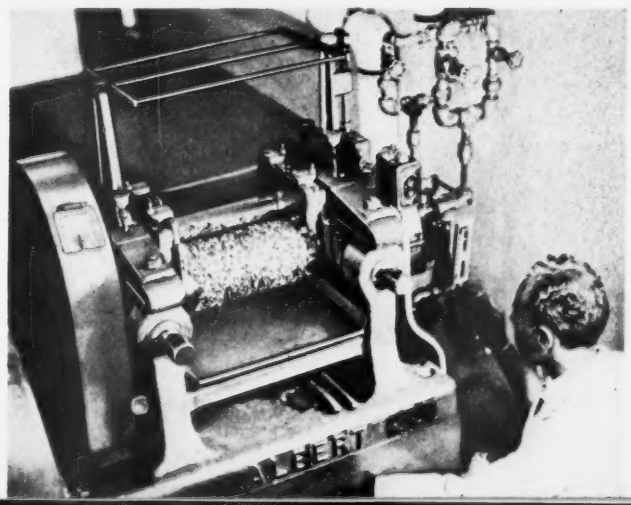
Curing press, completely enclosed in operation to provide exact curing temperatures.



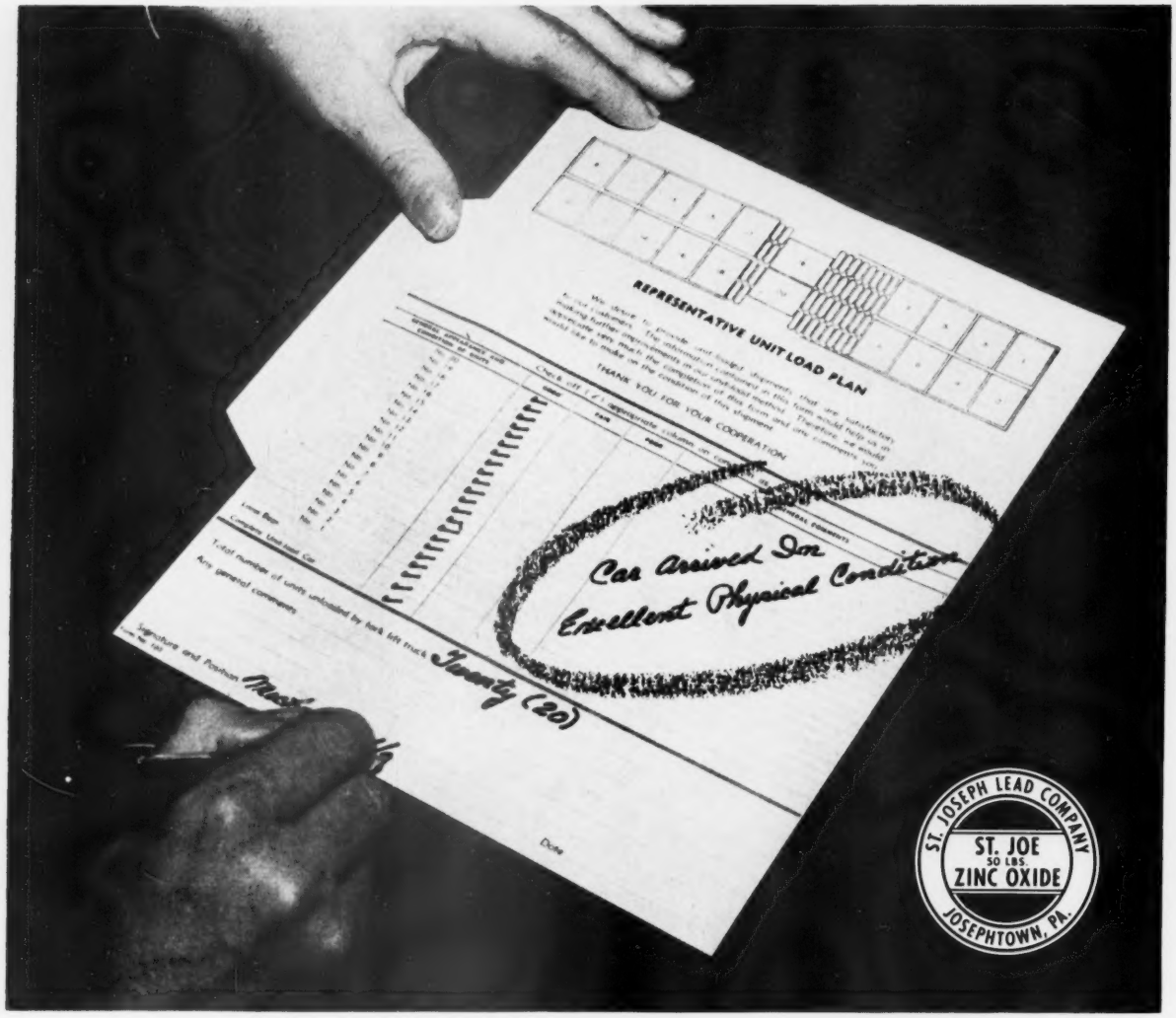
Section of laboratory mill room, showing rubber mills and open steam vulcanizer.



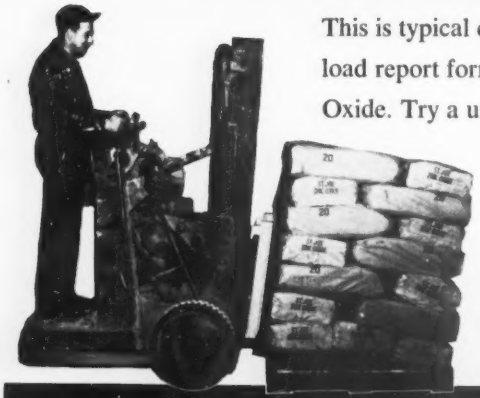
St. Joe Flexometer and other testing equipment used in evaluating rubber compounds for industry.



Rubber mill on which rubber test batches are compounded.



"car arrived in excellent physical condition"



This is typical of the reports received from customers on our customer unit-load report form. This form accompanies each unit-load car of St. Joe Zinc Oxide. Try a unit-load shipment of St. Joe Zinc Oxide and experience:

1. A saving of up to 50% of the unloading cost
2. Increased storage capacity
3. Improved material handling
4. Greater cleanliness

OUR 6-PAGE ILLUSTRATED FOLDER, CONTAINING DETAILED OPERATING DATA ON THE ST. JOE UNIT-LOAD METHOD IS YOURS FOR THE ASKING.

ST. JOSEPH LEAD COMPANY
250 Park Avenue, New York 17
Plant & Laboratory: Monaca (Josephtown) Pa.

The versatility of vinyl dispersion (Plastisol) compounds lend themselves to many wide and varied applications. The Watson-Standard laboratories can help you adapt these products to production and end uses.

Molding:

Watson-Standard Vinyl Plastisols and Rigidsols have been used with both slush molding and dip molding. Such items as doll and doll parts, toys, spark plug covers, electrical components, novelties, puppets, toilet valves, boats, light sockets and others are illustrations of this type of application.

Dipping:

Watson-Standard Vinyl Organosols and Plastisols have been applied by dipping. Varied end products include dishwasher baskets, dish racks and drainers, electrical wiring, gloves, and springs for the automotive and upholstery industries.

Spreading:

Watson-Standard Vinyl Plastisols and Organosols may be spread coated. Coated textiles and paper are typical of this type of application.

Spraying:

Special foundations of Watson-Standard Vinyl Organosols and Plastisols may be applied by spraying. Finishes for metal furniture, cabinets and blowers are representative uses.

Casting:

Since Watson-Standard Vinyl Plastisols are in liquid form and may be readily poured, they lend themselves to casting. Casting applications include films, sealants for automotive and refrigeration industries, ceramic pipe joint threads, and potting compounds.

Troweling:

Watson-Standard Vinyl Plastisols may be formulated for troweling. This type of application lends itself to linings for tanks and sealants.

The Watson-Standard laboratories have formulated compounds for many end uses and methods of application. We will assist you with your problems.

Watson-Standard CO.

225 GALVESTON AVE., PITTSBURGH 30, PA.

NEW YORK OFFICE: 15 Park Row, New York 38, N. Y. • CHICAGO OFFICE: 55 E. Washington St., Chicago 2, Ill.

PLASTICS • INDUSTRIAL FINISHES • CHEMICALS

YOU SAVE 3 WAYS

with Horse Head Unit Loads

1. SAVE ON UNLOADING

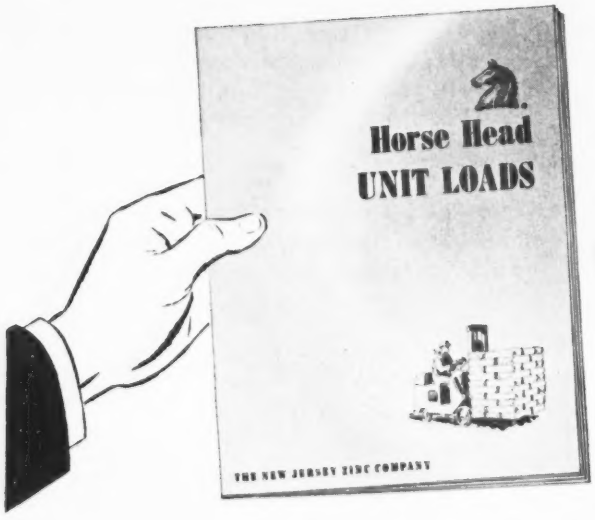
Save up to $40 a car by unloading Horse Head shipments with a fork lift-truck.

2. SAVE ON HANDLING

Cut in-plant handling cost up to 33%.

3. SAVE VALUABLE STORAGE SPACE

You can stock up to 180 bags (4½ tons) of Horse Head pigments in only 14 sq. ft. of floor space—a saving of up to 50% in space.



The details of these savings are explained in this booklet. Write for your copy now.

THE NEW JERSEY ZINC COMPANY

Founded 1848

160 Front Street, New York 38, N. Y.

HORSE HEAD PRODUCTS

United Carbon Company's Ivanhoe Furnace Black Plant

PARTIAL VIEW OF COMPANY'S IVANHOE PLANT NEAR FRANKLIN, LA., SHOWING ATMOSPHERIC COOLERS FROM FURNACES, COTTRELL PRECIPITATORS, CYCLONE COLLECTORS, AND BAG FILTER COLLECTORS

KOSMOS 60

KOSMOS 20

OUR IVANHOE PLANT

is a dependable source of outstanding quality furnace black — 100 million pounds of it a year.

The plant was built in 1952 for the manufacture of High Abrasion Furnace black. An additional unit was built in 1953 and placed on production of Semi-Reinforcing Furnace black.

Located near Franklin, Louisiana, and only about 100 miles west of New Orleans, the Ivanhoe plant is ideally situated to serve the Rubber Industry both here and abroad.

UNITED CARBON COMPANY, INC.

KOSMOS 60 **KOSMOS 20**

Two outstanding quality blacks from United's ultra modern Ivanhoe furnace black plant (near Franklin, La.).

KOSMOS 60 — high abrasion (HAF) oil base black is renowned for the processing, reinforcement and stamina required by today's tire treads and high quality mechanical goods for satisfactory performance.

KOSMOS 20—semi-reinforcing (SRF) gas base black is ideal for carcass, tube, bead wire insulation and numerous mechanical rubber goods, depending on a fine balance of easy processing, moderate reinforcing, high resilience, low heat build-up, and high resistance to flex cracking.

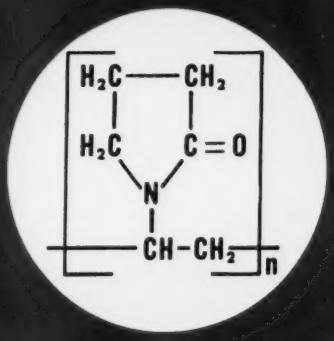
United Blacks are dependable for uniformity and performance. Standardize on United Blacks! You will be more than satisfied.

UNITED CARBON COMPANY, INC.

CHARLESTON 27, WEST VIRGINIA

NEW YORK AKRON CHICAGO BOSTON MEMPHIS

gaf's pure versatile polymer for industry



Polyvinylpyrrolidone (PVP)

unique combination of properties

- binds and stabilizes many organic and inorganic compounds
- compatible with physiologic fluids and body tissues
- substantive to hair
- detoxifies a wide variety of poisons, toxins and irritants
- protects and stabilizes suspensions, dispersions and emulsions
- thickens and modifies viscosity of aqueous systems
- prevents soil redisposition
- precipitates tannins and polycarboxylic acids
- forms hard, flexible films
- available in a wide variety of molecular weights for different solubility and viscosity specifications
- free-flowing white powder, soluble in water and most organic solvents

wide range of applications

- pharmaceutical (plasma expander, detoxifier, drug vehicle and retardant, tablet binder, etc.)
- chemical (protective colloid for polymerization and other chemical reactions)
- cosmetic (binder, stabilizer and film former in skin and hair preparations such as skin lotions, powder bases, hair tonics and lacquers, wave sets, shampoos, shaving creams, deodorants, depilatories, perfume fixatives, etc.)
- food (stabilizer, thickener, flavor improver,etc.)
- detergent (soil suspension, detoxifier, etc.)
- textile (dyestuff stripping agent, synthetic fiber additive, size component)
- also agricultural chemicals...lithography ...adhesives and coatings...paper...plastics ...rubber and many others.

For technical information on this GAF High Pressure Acetylene Derivative, price schedules, and samples please write to:

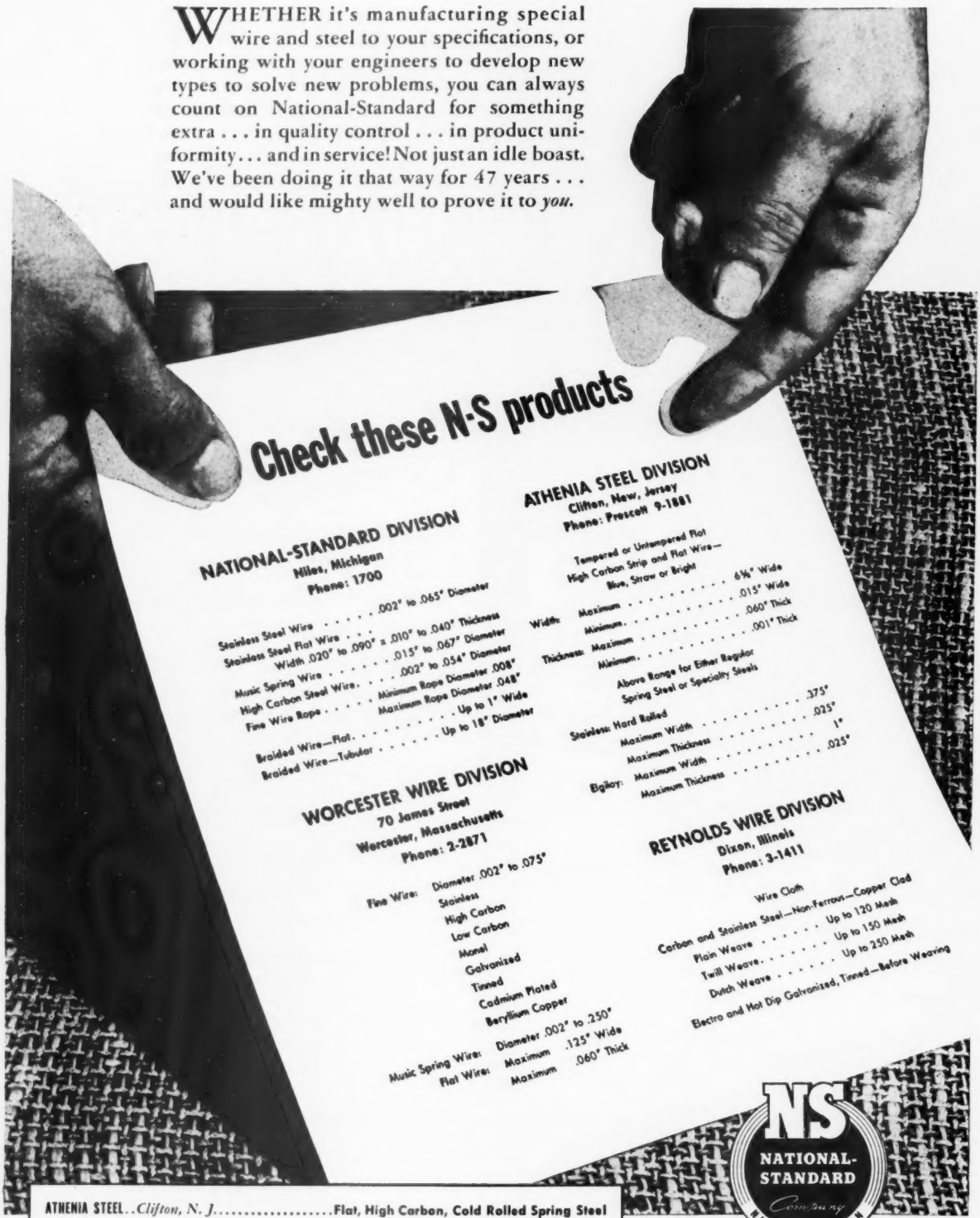
GENERAL ANILINE & FILM CORPORATION
COMMERCIAL DEVELOPMENT DEPARTMENT
435 HUDSON STREET NEW YORK 14 N Y

gaf

From Research to Reality

Need special-purpose wire or steel?

WHETHER it's manufacturing special wire and steel to your specifications, or working with your engineers to develop new types to solve new problems, you can always count on National-Standard for something extra . . . in quality control . . . in product uniformity . . . and in service! Not just an idle boast. We've been doing it that way for 47 years . . . and would like mighty well to prove it to *you.*


Check these N-S products
NATIONAL-STANDARD DIVISION
Niles, Michigan
Phone: 1700
Stainless Steel Wire . . . . . .002" to .065" Diameter
Stainless Steel Flat Wire . . . .
Width .020" to .090" x .010" to .040" Thickness
Music Spring Wire . . . . . .015" to .067" Diameter
High Carbon Steel Wire. . . . .002" to .054" Diameter
Fine Wire Rope . . . . . Minimum Rope Diameter .008"
Maximum Rope Diameter .048"
Braided Wire—Flat. . . . . Up to 1" Wide
Braided Wire—Tubular . . . . . Up to 18" Diameter
ATHENIA STEEL DIVISION
Clifton, New Jersey
Phone: Prescott 9-1881
Tempered or Untempered Flat
High Carbon Strip and Flat Wire—
Blue, Straw or Bright
Width: Maximum . . . . . 6⅜" Wide
Minimum. . . . . .015" Wide
Thickness: Maximum . . . . . .060" Thick
Minimum. . . . . .001" Thick
Above Range for Either Regular
Spring Steel or Specialty Steels
Stainless: Hard Rolled . . . . . .375"
Maximum Width . . . . . .025"
Maximum Thickness . . . . . 1"
Bigkay: Maximum Width . . . . . .025"
Maximum Thickness
WORCESTER WIRE DIVISION
70 James Street
Worcester, Massachusetts
Phone: 2-2871
Fine Wire: Diameter .002" to .075"
Stainless
High Carbon
Low Carbon
Monel
Galvanized
Tinned
Cadmium Plated
Beryllium Copper
Music Spring Wire: Diameter .002" to .250"
Flat Wire: Maximum .125" Wide
Maximum .060" Thick
REYNOLDS WIRE DIVISION
Dixon, Illinois
Phone: 3-1411
Wire Cloth
Carbon and Stainless Steel—Non-Ferrous—Copper Clad
Plain Weave . . . . . Up to 120 Mesh
Twill Weave. . . . . Up to 150 Mesh
Dutch Weave . . . . . Up to 250 Mesh
Electro and Hot Dip Galvanized, Tinned—Before Weaving

ATHENIA STEEL..*Clifton, N. J.*.....Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD..*Niles, Mich.*.....Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE..*Dixon, Illinois*.....Industrial Wire Cloth
WAGNER LITHO MACHINERY..*Jersey City, N. J.*.....Metal Decorating Equipment
WORCESTER WIRE WORKS..*Worcester, Mass.*.....Round and Shaped Steel Wire, Small Sizes

NS NATIONAL-STANDARD Company NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.
NILES, MICHIGAN

INDOIL®
CHEMICAL PRODUCTS

for
OUTSTANDING OIL RESISTANCE
try
INDONEX PLASTICIZERS
REG. U.S. PAT. OFF.
with HIGH OIL-EXTENDED **GR-S**

With GR-S 1708 (containing 37.5 parts extender oil/100 GR-S) compounded with several leading heavy process oils, only "INDONEX" gave compounds showing less than 100% volume increase on 70 hours immersion in ASTM #3 oil at 212 F. Resistance to oven aging is excellent. See Circular 13-48.

Send for:
Circular 13-48 and
General Bulletin 13

INDOIL CHEMICAL CO.
910 SOUTH MICHIGAN AVENUE
CHICAGO 80, ILLINOIS

MR. CLIMCO SAYS . . . .

CLIMCO LINERS

save time at the bias cutter and cutting table

Perfect separation of stock and liner is all important during these operations—for stock adhesions at either point cause expensive down time. You can avoid such production headaches by using Climco Processed Liners that can be readily peeled from the stock without sticking.

Climco Processing of your liners assures many other profitable advantages: Liner life is greatly increased, tackiness of the stock is preserved, and gauges are more easily maintained. Latitude in compounding is enlarged, lint and ravelings are eliminated and horizontal storage is facilitated.

Since 1922 Climco Processed Liners have proved their worth to the rubber industry. Give them a trial in your plant.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio, U.S.A.
Cable Address: "BLUELINER"

ILLUSTRATED LINER BOOKLET

Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

LINERETTE INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO
PROCESSED LINERS

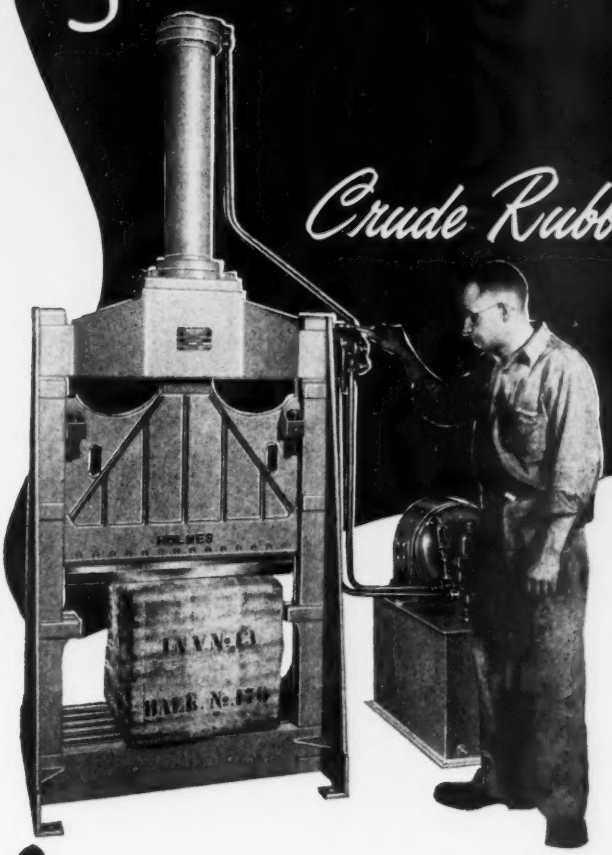
Serving the Rubber Industry for 32 Years

CLIMCO

CLIMCO

Introducing--

Crude Rubber Bale Cutter



If you cut crude rubber bales in your plant--regardless of how you do it--it will definitely pay you to find out how the new and improved Holmes Crude Rubber Bale Cutter can save your time...increase your production...and...decrease your costs.

DESIGNED FOR MAXIMUM SAFETY

Previous models of the Holmes Crude Rubber Bale Cutter have been widely used throughout the rubber industry for many years. In plant after plant they have conclusively demonstrated their high efficiency...low operating cost...and...maximum safety.

The new and improved Holmes Crude Rubber Bale Cutter is a complete, ready-to-operate hydraulic unit including pump, 30 gal. oil tank, and motor.

The new and improved Holmes Crude Rubber Bale Cutter incorporates all the features of earlier models...and...is augmented by many important new developments besides. While it is engineered for top performance--it is also designed to provide the utmost safety for the operator. What does it cost? You'll be surprised at its unusually low price.

Send for this Holmes Crude Rubber Bale Cutter broadside --TODAY

WRITE OR WIRE FOR SPECIFIC DETAILS--regardless of your particular requirements. With more than 50 years know-how specializing in machinery and molds for the rubber industry--Holmes can help you solve your problems, too, just as they have for so many others. No obligation, of course.

Stanley H. Company

440 N. Sacramento Blvd., Chicago 12, Ill.

TY·PLY

... the Word that's as good as its Bond!

TY-PLY the RUBBER-TO-METAL ADHESIVE

that Bonds for a Lifetime

TY-PLY **Q** or **3640** for bonding Natural, GR-S, and Butyl

TY-PLY **S** for bonding Neoprene

TY-PLY **BN** for bonding N-types

TY-PLY will adhere most vulcanizable rubber compounds to almost any clean metal surface

Marbon

MARBON CORP.

GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

TY-PLY has stood the test of time . . . since '39

Whatever your roll requirements—whether for conventional applications or for special or unusual ones—consult us.

Our staff of experienced engineers, metallurgists and seasoned roll makers, plus the unmatched facilities of our 6 great plants, are at your service.

UNITED ENGINEERING AND FOUNDRY COMPANY

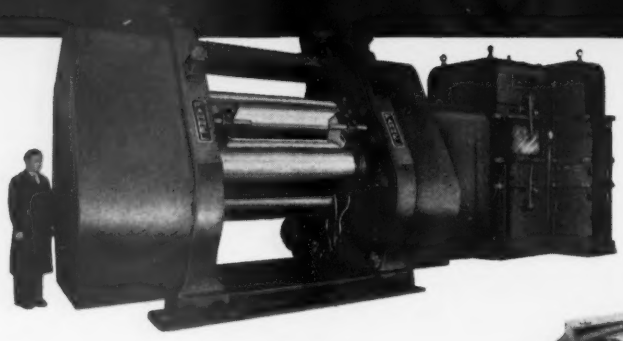
PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh • Vandergrift • New Castle
Youngstown • Canton

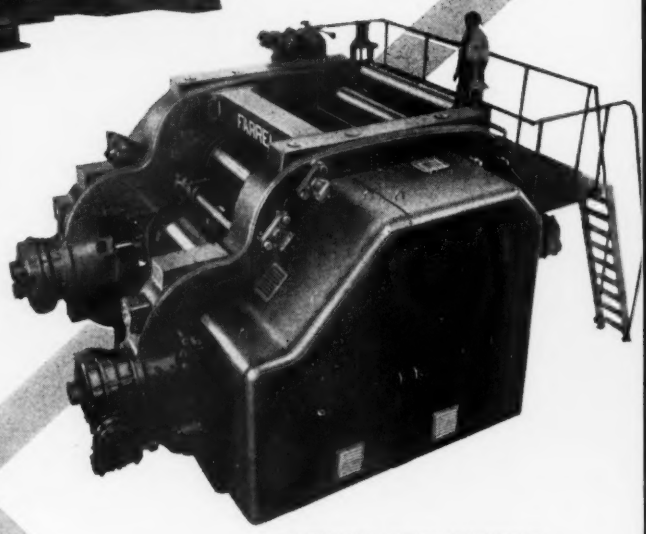
Subsidiaries Adamson United Company, Akron, Ohio
Lobdell United Company, Wilmington, Delaware
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

What is new in RUBBER and PLASTICS Processing Machinery?

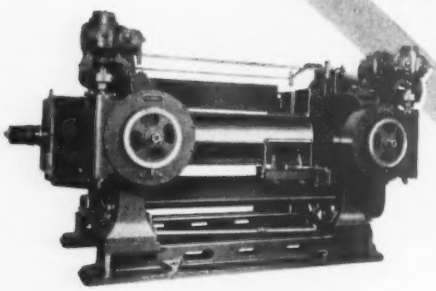


THREE-ROLL TRI-ANGULAR* CALENDERS
The machine of the future for any type of production requiring two calendering passes. Right-angle arrangement of rolls provides closer control of gauge and easier feeding conditions.

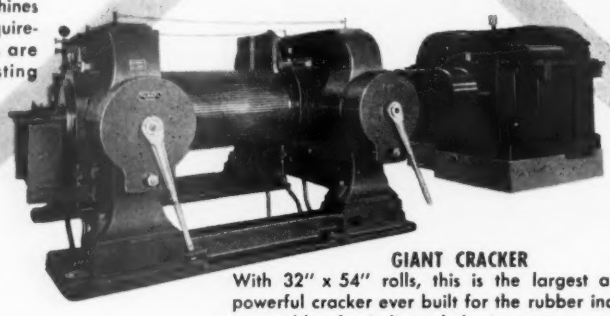


FOUR-ROLL "Z"* CALENDERS
A leading rubber company, in describing its new Farrel-Birmingham "Z" calender train for double-coating tire fabric, says that it "insures unmatched uniformity of quality."

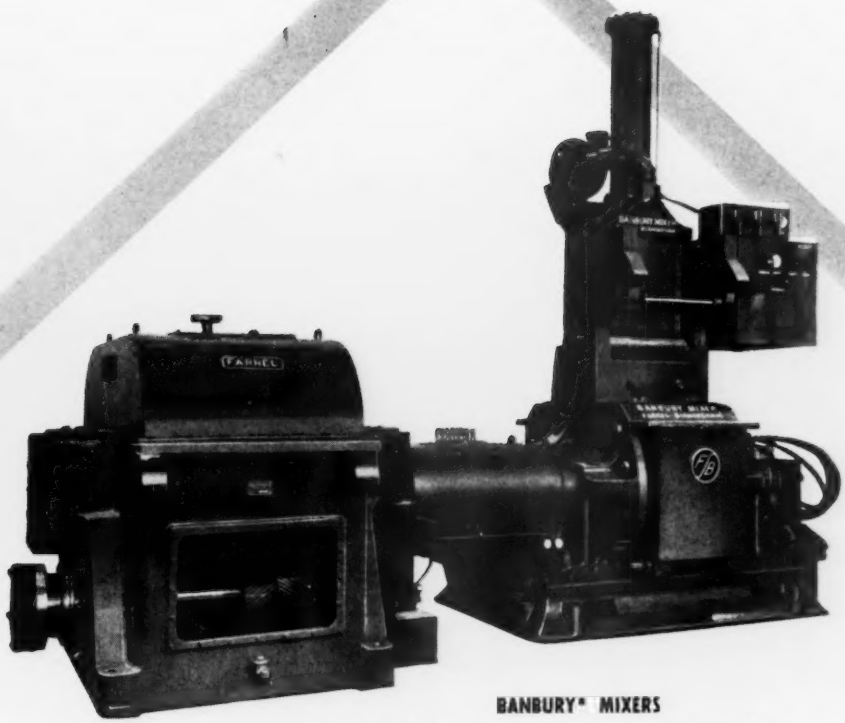
These machines have proved to be equally outstanding for the high-speed production of rubber and plastic film and sheet, and for single coating. Their unique roll arrangement, crossed axes device and other features permit finer control of gauge.



ROLL MILLS
Farrel-Birmingham mills for mixing, grinding, warming and sheeting are built in a complete range of sizes, from 6" x 13" for the laboratory up to 28" x 84" heavy-duty machines for the factory. For special requirements, variations in designs are obtainable, often from existing plans.

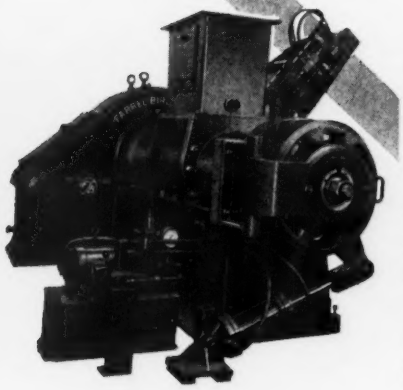


GIANT CRACKER
With 32" x 54" rolls, this is the largest and most powerful cracker ever built for the rubber industry. It is capable of grinding whole tire carcasses at a rate of 10,000 to 15,000 pounds per hour. The rubber is stripped clean of the bead during the process.



BANBURY* MIXERS

The development of greater efficiency in the Banbury mixer is a continuing process at Farrel-Birmingham. Recent outstanding improvements, which include the Unidrive, make possible faster mixing, better quality and lower production costs.



EXTRUDERS

Designed to receive stock directly from a Banbury and discharge into a calender or other processing unit, these machines require no operator. Stock is strained and extruded, or extruded without straining, in a continuous strip of uniform thickness and width.

As the world's largest manufacturer of machinery for processing rubber and plastics, Farrel-Birmingham has made many outstanding engineering contributions to the efficient conversion of raw material to finished or semi-finished product.

Among recent developments are the four-roll "Z" calender and the three-roll *Tri-angular* calender. Originated and developed by Farrel-Birmingham engineers, both of these designs are establishing new standards for accuracy and economy in calendering.

Other types of machines, such as Banbury mixers, mills, crackers and extruding machines, are constantly being modified and improved in design to increase production efficiency and reliability of operation.

Write for further information about any of the equipment mentioned on this page. Descriptive literature will be sent to you without cost or obligation.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

F-B PRODUCTION UNITS

Banbury Mixers • Plasticators • Pelletizers • Extruders • Calenders • Mixing, Grinding, Warming and Sheeting Mills • Refiners • Crackers • Washers • Hose Machines • Bale Cutters • Hydraulic Presses and Other Equipment for Processing Rubber and Plastic Materials

FB-831

Farrel-Birmingham®

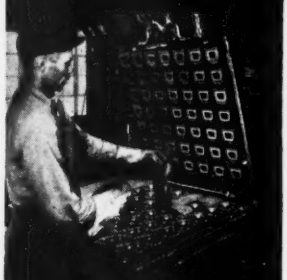
*Trade-marks of Farrel-Birmingham Company, Inc.

On Green tires or molds

DOW CORNING Silicone Lubricants Cut costs... Improve finish

Deep Cavity Molds

Curing Bags



Heavily Loaded Stocks

WORK'S fun for Moe Muscles when he gets green tires already sprayed with the right amount of a solvent solution of Dow Corning Mold Release Fluid and talc. All he has to do is put them in and take them out. Maybe he misses the chance to play fireman with the spray gun, but the boss saves money.

Same's true for Inspector Mike. Rejects due to non-knits, foldovers and loose tuck-unders are practically eliminated. About all he has to do is pass on to the shipping department tires with uniformly sharp detail and a "patent-leather" finish that sells on sight.

Whether they're used on green tires or on the molds, Dow Corning Silicone release agents cut mold maintenance costs by as much as 90%; reduce rejects to the vanishing point; improve the quality of tires and mechanical rubber goods. That's why most rubber companies here and abroad specify Dow Corning Silicone mold release agents; emulsion for curing bags and molds; fluid for green carcass, bead and parting line release.

For more information call our nearest branch office or write direct for Data Sheet CM-15

DOW CORNING SILICONES

DOW CORNING CORPORATION
MIDLAND, MICHIGAN

Atlanta • Chicago • Cleveland • Dallas • Detroit • Los Angeles • New York • Washington, D. C. (SILVER SPRING, MD.)
Canada: Dow Corning Silicones Ltd., Toronto • Great Britain: Midland Silicones Ltd., London

Compressing 200,000 square feet into 60

You're looking at a giant titanium plant in miniature—as set up in the Glidden Laboratories in Baltimore. It is a small-scale "plant" that transforms jet black titanium ore into gleaming white pigment. This hydrolysis process provides an accurate check on every shipment of titanium ore received by Glidden.

It's all part of the vigilant Glidden quality control program—established to assure you the finest in pigments of all types—ZOPAQUE Titanium Dioxides; CADMOLITH Reds and Yellows; SUNOLITH Lithopones. Write for detailed specifications today.

THE GLIDDEN COMPANY

Chemicals • Pigments • Metals Division

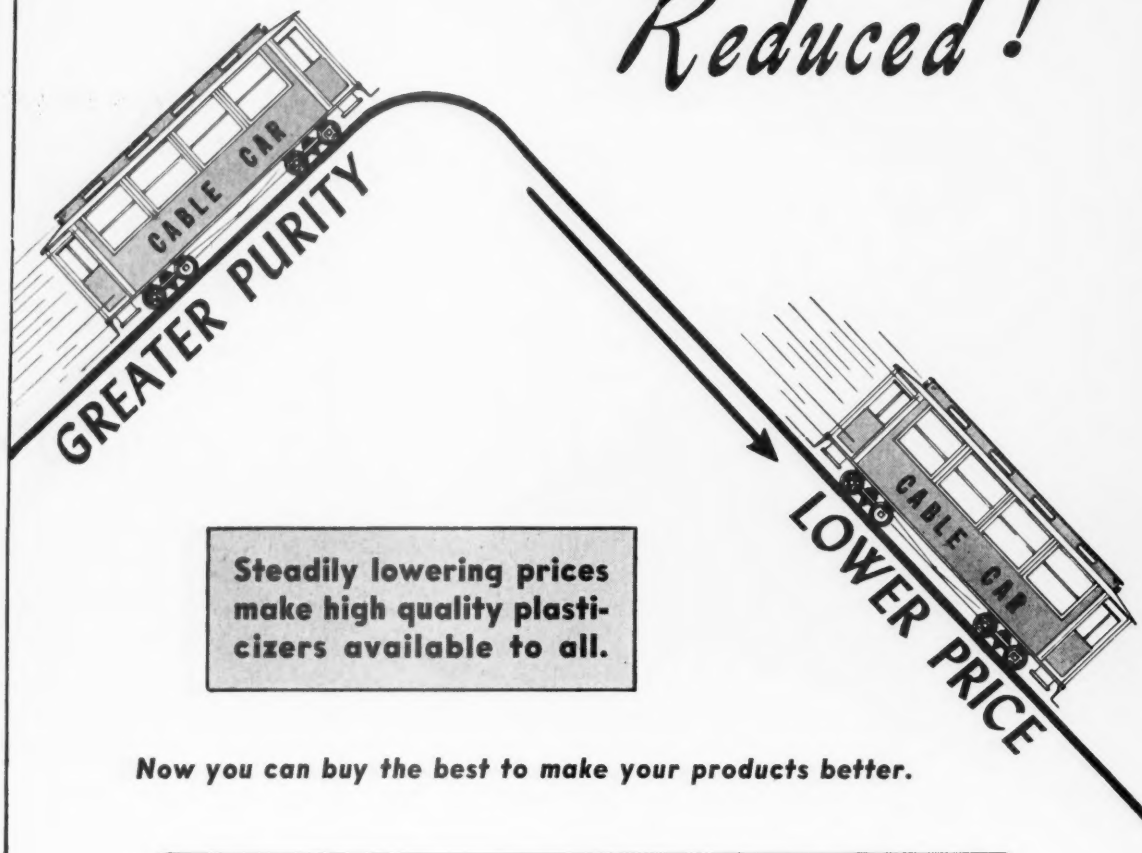
Baltimore, Maryland • Collinsville, Illinois • Hammond, Indiana • Oakland, California

CHEMICALS
PIGMENTS
METALS

QUALITY
Glidden
PRODUCTS

SEBACIC PLASTICIZERS

Reduced!



Steadily lowering prices make high quality plasticizers available to all.

Now you can buy the best to make your products better.

Newly reduced prices of Sebacates now make it possible to incorporate their well known superlative features into your product.

BINNEY & SMITH CO. • Distributor to the Rubber Industry

HARCHEM

41 EAST 42nd STREET, NEW YORK 17, N. Y.

THE KEY TO HARCHEM® BETTER PLASTICS

HARDESTY CHEMICAL DIVISION
W. C. HARDESTY CO., INC.

Manufacturers of Sebacic Acid

Canadian Distributor: W. C. Hardesty Co. of Canada Ltd., 975 Lakeshore Road, New Toronto, Canada

RELIABLE ZINC OXIDES

AZO-ZZZ-44 and AZO-ZZZ-55 assure good dispersion and easy processing because of their uniform particle size and absence of extreme fines. With AZO-ZZZ-11, 22, 33, (Acicular types) and special grades, a complete range of zinc oxides is offered for every rubber requirement.

A RELIABLE SOURCE

American Zinc assures an uninterrupted supply of zinc oxide. Recent discovery and development of a new, large ore body, added to previous American Zinc reserves, provides sufficient ore to last many years at the current rate of production.

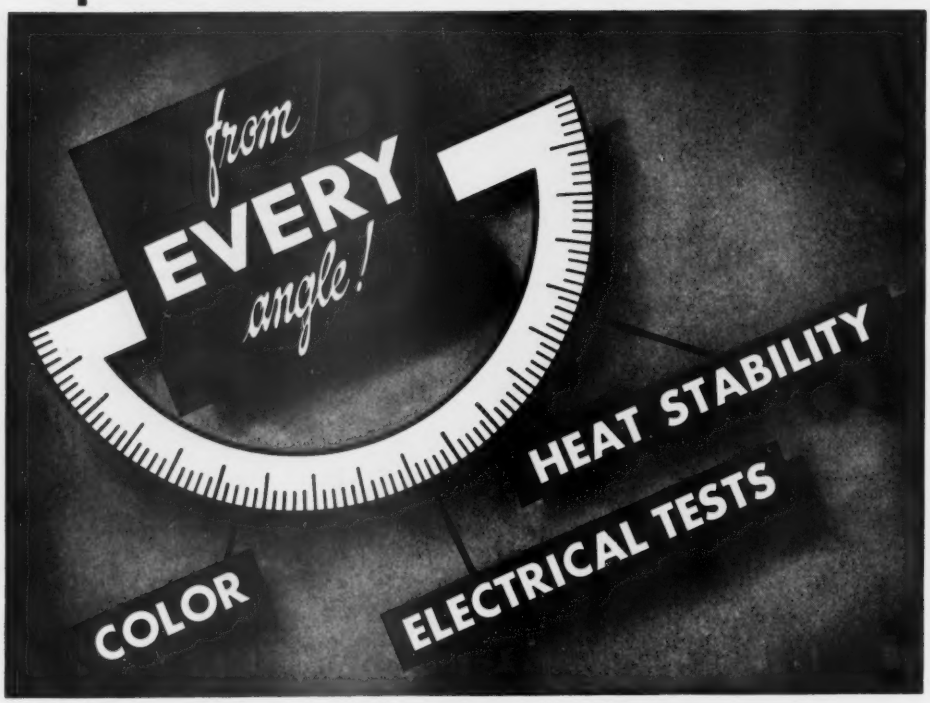
AZO **ZZZ-44**
ZZZ-55

AMERICAN ZINC SALES COMPANY

distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK



PIGMENT NO. 33

for Compounding

VINYLS AND SYNTHETIC RUBBER

Sample and technical data sent promptly on request

SOUTHERN CLAYS, Inc.

33 RECTOR STREET
NEW YORK 6, N. Y.

RUBBER RED BOOK

1953-54 Edition

1953-54 Edition **Ninth Issue**
1200 Pages **Cloth Bound**

•

PRICE: $10.00 postpaid

The 1953-54 edition of the RUBBER RED BOOK, the *Directory of the Rubber Industry*, is a volume of 1200 pages — the largest issue ever published.

This increase is reflected in almost every section of the book, particularly in the number of rubber manufacturers, with a corresponding increase of names in the "Who's Who" Section to over 12,000 listings. A new section on "Export Agents" has also been added.

The book is divided into three main sections:

I. RUBBER MANUFACTURERS — with personnel, products made, and a geographical breakdown of rubber plants.

II. SUPPLIERS — with complete product classifications of Machinery, Chemicals, Fabrics, Rubber (Natural, Synthetic, Reclaimed, Scrap), Latex, and other materials—with full names and addresses.

III. WHO'S WHO—a section of over 12,000 names of leading people in the rubber industry, with company connections and addresses.

In addition, other sections cover Brand Names (Chemicals, Synthetic Rubber, Reclaimed Rubber); Consulting Technologists; Sales Agents and Branch Offices of Suppliers; Educational Courses In Rubber Chemistry and Technology; Technical Journals; Trade and Technical Organizations.

The RUBBER RED BOOK has become *the most indispensable and widely used book in the rubber industry* and is invaluable as a source of up-to-date information for rubber manufacturers, suppliers and all others interested in the rubber manufacturing field.

Order Your Copy Today!

RUBBER AGE

250 West 57th St., New York 19, N. Y.

ORONITE CHEMICAL COMPANY

Original and major source of supply!

POLYBUTENES

An important raw material in a variety of mechanical rubber products

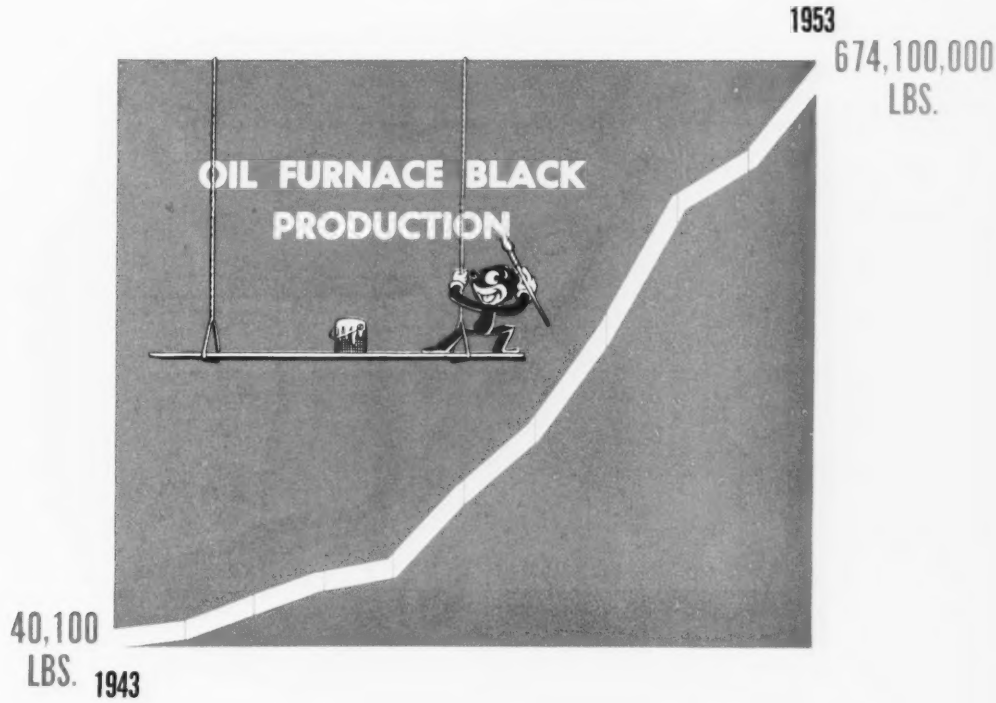
Since 1935, when Oronite Polybutene was first produced and sold, these important raw materials have become widely used in a variety of rubber products. Their light color makes them specially acceptable for compounding light-colored molded rubber goods.

PROPERTIES: Oronite Polybutenes are clear, light in color, tacky, chemically inert liquids. They will not become gummy or waxy, do not harden, darken or change in any essential property over long periods of atmospheric exposure. Oronite Polybutenes can readily be emulsified using standard techniques and equipment. In the emulsified form or in their natural form, they are useful as tackifiers, plasticizers or extenders for natural or synthetic rubber products. Available in a number of high viscosity ranges to meet your requirements. Write or call any Oronite office for Polybutenes technical bulletin.

ORONITE CHEMICAL COMPANY

38 Sansome St., San Francisco 4, Calif. • Standard Oil Bldg., Los Angeles 15, Calif.
30 Rockefeller Plaza, New York 20, N. Y. • 600 S. Michigan Ave., Chicago 5, Ill.
Mercantile Securities Building, Dallas 1, Texas

2904



A decade of progress

Some of the most difficult technical problems imaginable have been set before the American rubber industry by the fortunes of war and peace.

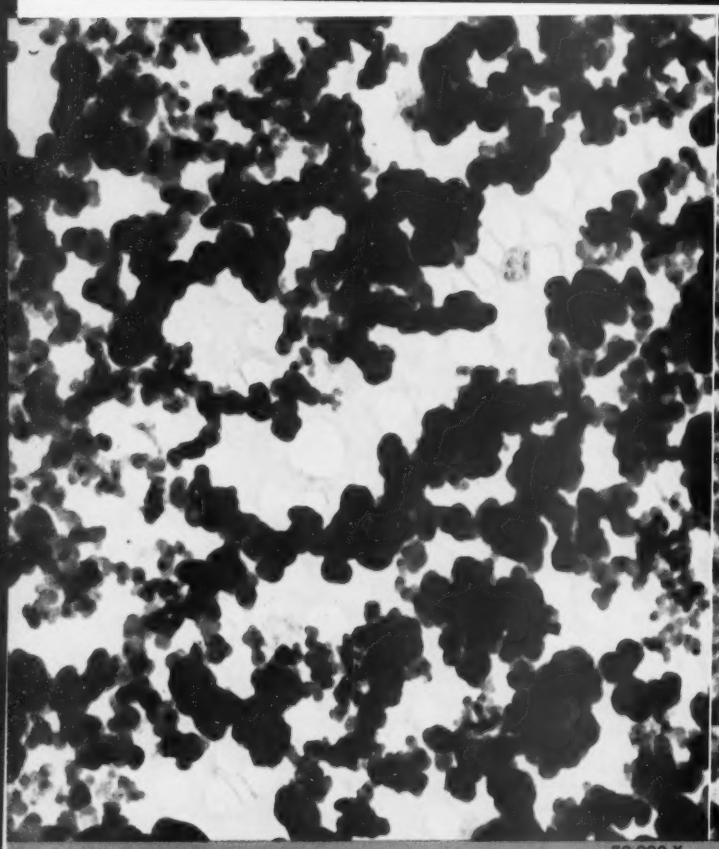
Yet the rubber industry, with characteristic courage and competence, has managed to continue its drive for better products at lower costs.

Growth such as we have witnessed since 1943 in oil furnace blacks can only be based on the rubber industry's fundamental concern for efficiency and performance.

We are proud that our Philblacks contribute as they do to the rubber industry's many developments in the field of low-cost transportation.

In the years ahead we shall continue to devote our engineering and scientific skills to the many interests we share with you in the rubber industry.

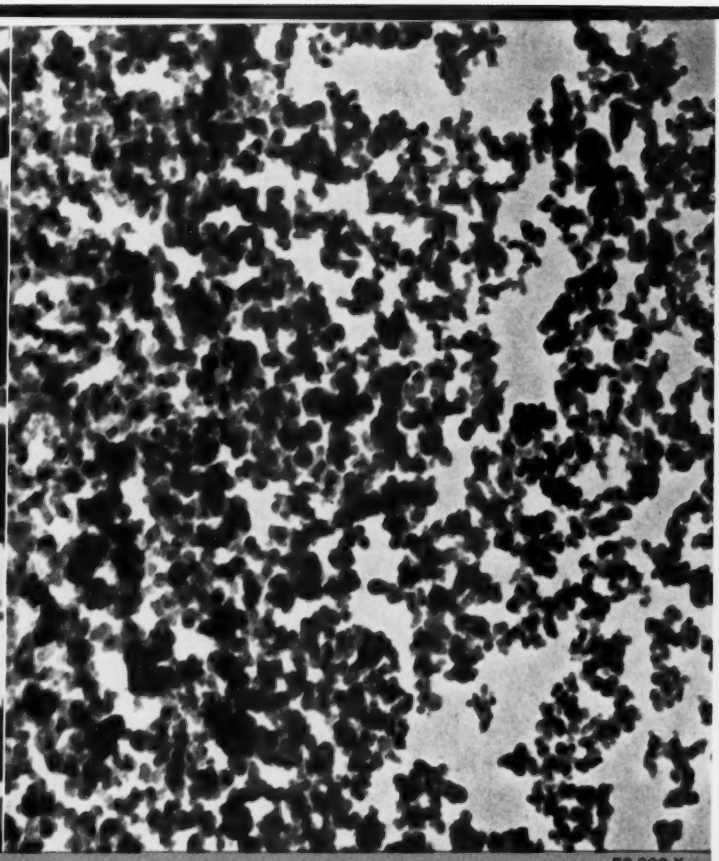
Phillips 66 PHILLIPS CHEMICAL COMPANY *Philblack Sales Division*



50,000 X

PHILBLACK* A *FEF* Fast Extrusion Furnace
***INTRODUCED* December 25, 1943**

Ideal for smooth tubing, accurate molding, satiny finish. Mixes easily. High hot tensile. Disperses heat. Non-staining.



50,000 X

PHILBLACK* O *HAF* High Abrasion Furnace
***INTRODUCED* September 17, 1947**

For long, durable life. Good electrical conductivity. Excellent flex life. Fine dispersion in new or reclaim polymers.

*A TRADEMARK

The four Philblacks ...and how they grew

In the early 1930's, Phillips Petroleum Company was the largest supplier of natural gas for carbon black manufacture.

On the surface this seemed like an ideal situation, but Phillips was not satisfied with the orthodox methods of carbon black manufacture.

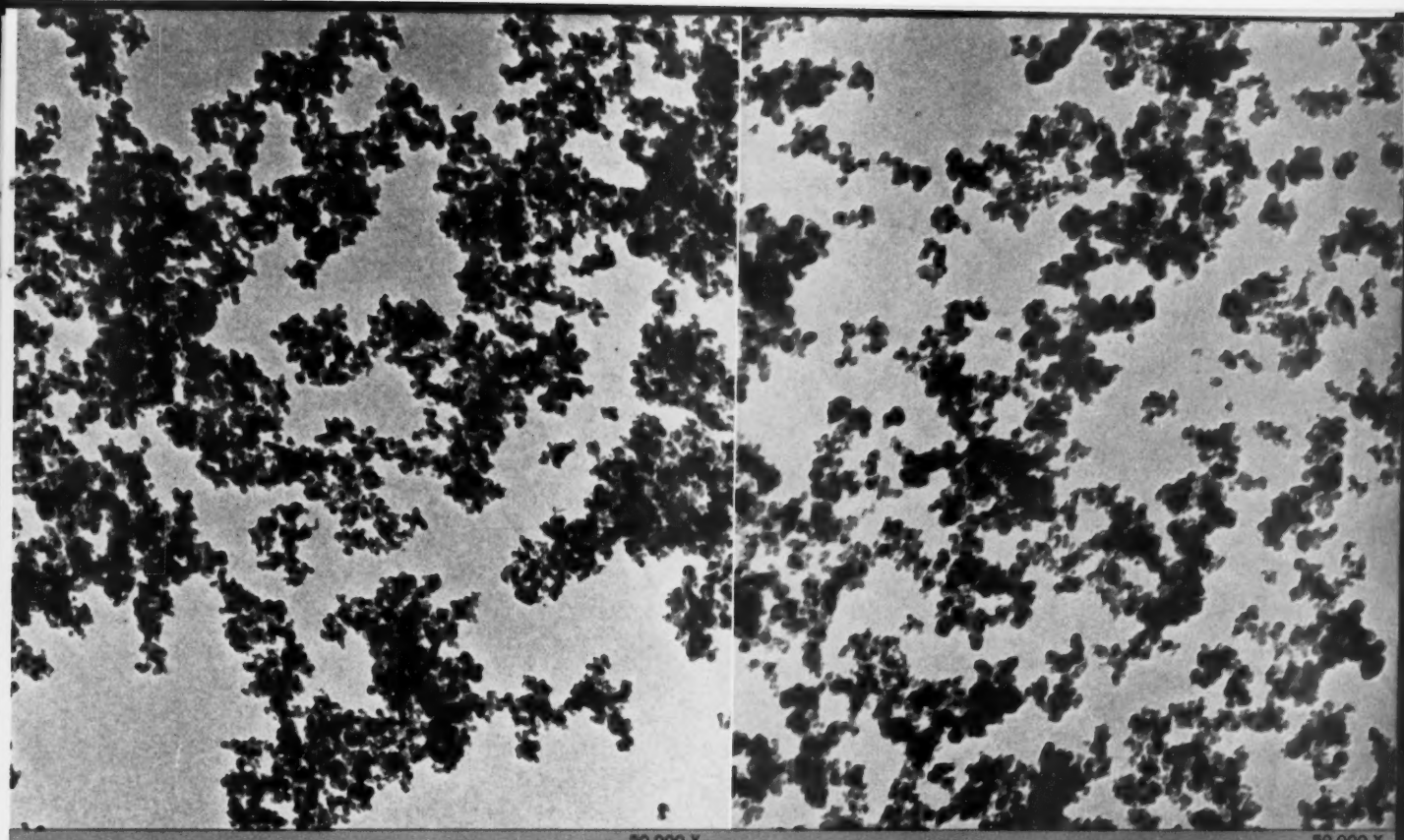
The channel process then so widely used converted less than five per cent of the carbon in the gas into carbon black. This extremely low efficiency was subject to close scrutiny from several viewpoints:

1. A return of about two pounds of channel black per thousand cubic feet of natural gas represented a questionable return on a valuable natural resource.

2. As natural gas was upgraded to serve higher value markets, the supply available for channel plants was certain to shrink.

3. The inefficient channel process could be expected to encounter critical competition from more efficient methods of carbon black manufacture.

In 1936, Phillips began a program to develop a more efficient process using a liquid hydrocarbon feed instead of gas. Pilot plants demonstrated carbon



PHILBLACK® E *SAF* Super Abrasion Furnace
INTRODUCED **October 6, 1952**

Toughest black yet. Extreme abrasion resistance. Withstands aging, cracking, cutting and chipping like a champion!

PHILBLACK® I *ISAF* Intermediate Super Abrasion Furnace *INTRODUCED* May 25, 1953

Superior abrasion resistance at moderate cost. Excellent resistance to cuts and cracks. More high speed tread miles for less money.

black recoveries in excess of 50 per cent. Thus, before Pearl Harbor, the Philblack A process was firmly in hand. And under wartime conditions of steel shortage, the high efficiency and low steel requirements of the Philblack process were extremely helpful in making large quantities of the new black promptly available for the war effort.

After the exigencies of war eased, Phillips began an intensive study to develop a new oil furnace black superior in reinforcement to channel black when incorporated in natural or synthetic polymers. This new black, Philblack O, came on the commercial scene in September 1947.

Rubber manufacturers soon found that Philblack O and synthetic rubber produced tire treads that consistently gave 30 per cent greater wear than control compounds made with natural rubber and channel black.

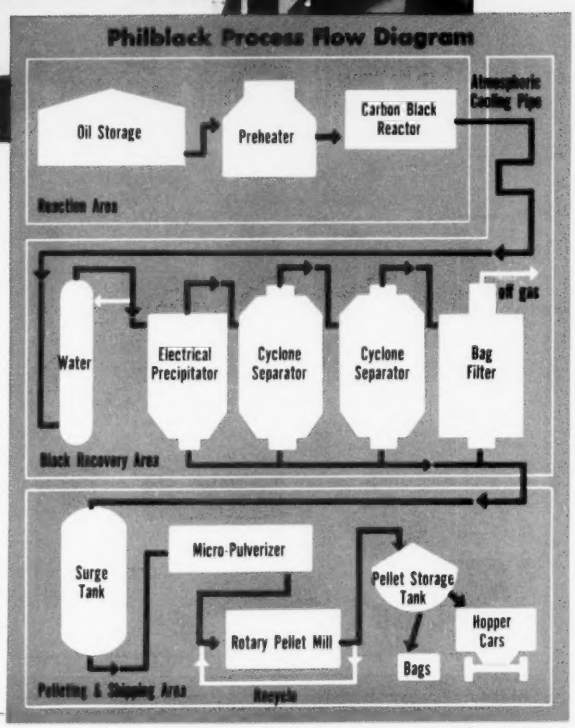
As tire makers swung over to Philblack O, Phillips engineers found themselves designing and constructing what has become the world's largest plant for the production of furnace blacks.

Continued research by Phillips resulted in the development in 1952 of Philblack E, a Super Abrasion Furnace black of higher structure and still finer particle size. This extraordinary black, Philblack E, is superior to all other blacks in industrial applications requiring extreme resistance to abrasion and to cut and crack growth. Philblack E is a specific answer to the excessive wear encountered by tires on today's more powerful, faster automobiles.

Tire manufacturing demands for a sturdy black at moderate cost initiated the production in 1953 of an Intermediate Super Abrasion Furnace (ISAF) black – Philblack I. This black imparts superior abrasion resistance at remarkably low cost. It also provides excellent resistance to cut and crack growth and gives increased tire mileage at high speeds.

With four Philblacks in production, the end is not yet in sight by any means. Research on carbon black proceeds with one chief aim:

". . . to help the rubber industry in its steady advance toward higher quality and lower costs . . ."



World's largest and finest furnace black plant at Borger, Texas produces Philblack for you

NOW is the time to investigate fully the many advantages Philblack can bring to your products.

Whether you are a customer or a prospective customer, our long experience with oil furnace black is fully available to you. PHILLIPS CHEMICAL COMPANY, Philblack Sales Division, 318 Water Street, Akron 8, Ohio.

SEE YOU IN LOUISVILLE . . . April 14, 15, 16

Ah, Science! How Philblack looks forward to the 65th Meeting of the Division of Rubber Chemistry, American Chemical Society! Abstruse, technical papers . . . incomprehensible slides . . . evenings filled with scientific chitchat. ***SEE YOU IN LOUISVILLE!***

a complete cure

. . . . . for Hose, Cable, Boots, Shoes and general merchandise is provided by the range of SHAW Vulcanizing Pans for open steam cures, Double Cased, Hot Air and Air Circulation. Made in any size up to 9 ft. internal diameter by any length. Send for leaflet No. R. T. 312.

Type 673—A horizontal Shoe Pan arranged for continuous circulation of pre-heated air. Can be supplied with carriages, rails, loading and unloading gear.

SHAW

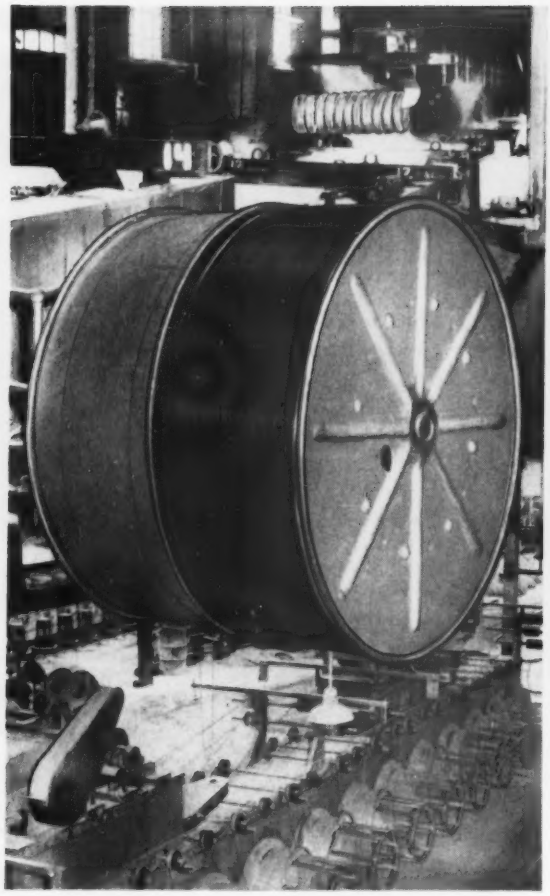
VULCANIZING PANS

FRANCIS SHAW & COMPANY LIMITED, MANCHESTER 11, ENGLAND

TELEPHONE: East 1415/8 TELEGRAMS: CALENDER, MANCHESTER

LONDON OFFICE: 34 VICTORIA STREET LONDON SW1 TELEPHONE: ABBEY 1800 TELEGRAMS: VIBRATE PHONE LONDON

Enquiries to Francis Shaw (Canada) Limited, Grahams Lane, Burlington, Ontario, CANADA



Inflation: a cockeyed economic condition that makes the prices you get look good and the prices you pay look awful.

Inflation has affected the wire making business just as it has all other industries. But the upsurge in the cost of raw material, handling, labor and everything else along the line has been to us a challenge. Here at Johnson, through improved manufacturing, we have been able to meet inflation part way, with the result that Johnson High Carbon Wire, has advanced in price less than many other commodities that have zoomed since jet planes passed speed of sound, approached speed of gossip.

JOHNSON special bronze plated wire — standard for tire manufacturers and for vacuum and defroster hose producers. Advantages — uniformly clean finish . . . maximum adhesion to rubber . . . higher elongation . . . extra fatigue properties.

JOHNSON STEEL & WIRE CO., INC.
WORCESTER 1, MASS.
Akron, Ohio Los Angeles, Calif.
A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

THE CARTER BELL MFG. CO. SINCE CARTER BELL PRODUCTS 1903 SPRINGFIELD, NEW JERSEY

Vulcanized
VEGETABLE OILS

rubber substitutes

Types, grades and blends
for every purpose, wherever
Vulcanized Vegetable Oils
can be used in production
of Rubber Goods—
be they Synthetic, Natural,
or Reclaimed.

A long established and proven product.

THE CARTER BELL MFG. CO.
SPRINGFIELD, NEW JERSEY

Represented by
HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Trenton, Chicago, Denver, Los Angeles

Announcing

HI-SIL® X303

FOR SILICONE RUBBER COMPOUNDING

HI-SIL X303 has been developed specifically for silicone rubber compounding.

It provides . . . *good processing* • *good reinforcement* • *low water absorption* . . . at low cost.

HI-SIL X303 also shows promise in other applications such as adhesives and rigid vinyls.

Available only in limited pilot plant quantities at this time.

Write for working samples of HI-SIL X303. Contact Rubber Pigments Section, Columbia-Southern Chemical Corporation, One Gateway Center, Pittsburgh 22, Pa.

TYPICAL PROPERTIES

Specific gravity	1.95
Average particle size	0.022 microns
Surface Area	160 square meters/gram
Color	White
pH in 5% water suspension	4.5
Ignition loss	10%
SiO_2	88%
NaCl	0.04%
Na_2SO_4	0.1%

COLUMBIA-SOUTHERN

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

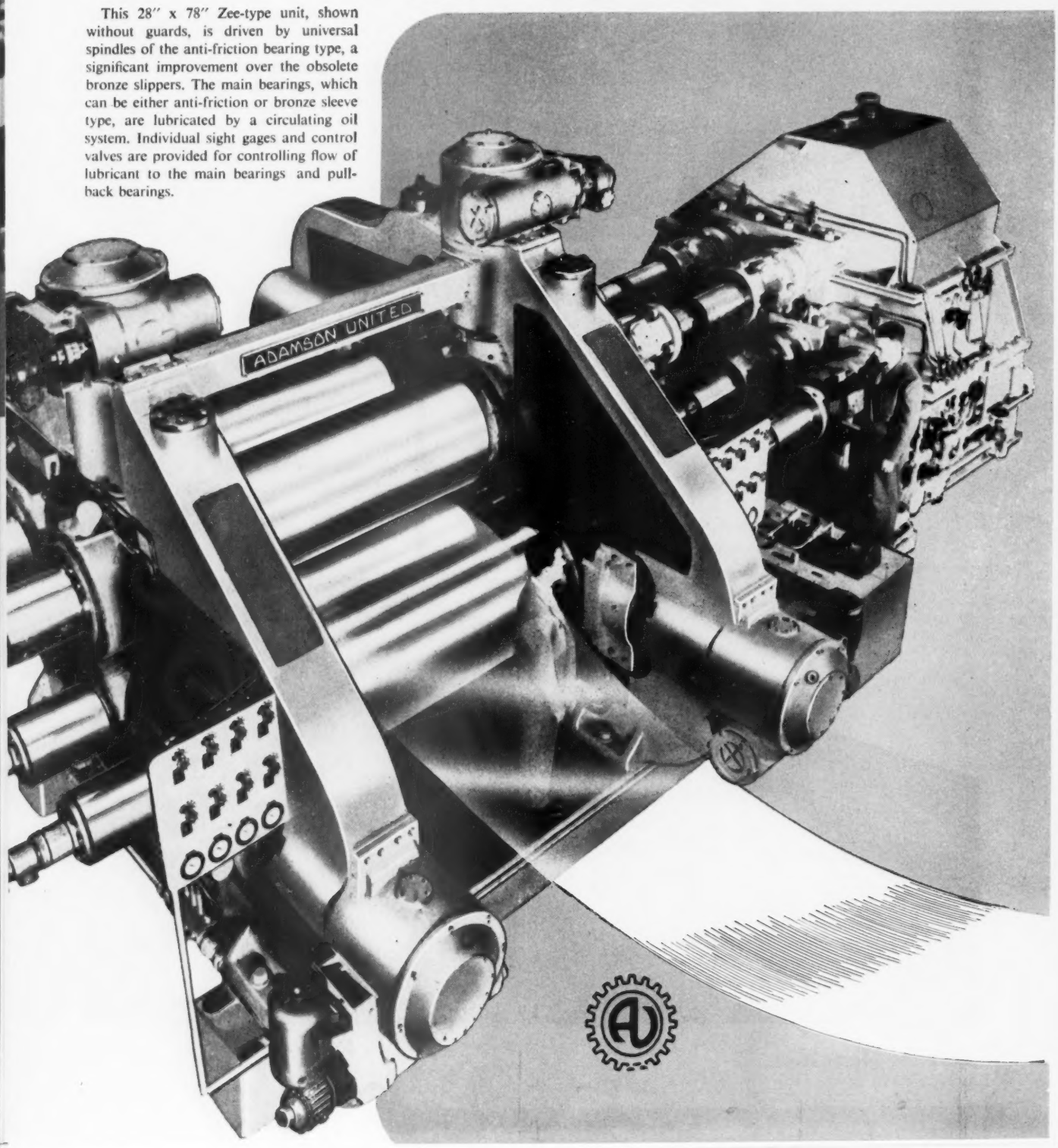
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

ONE GATEWAY CENTER • PITTSBURGH 22 • PENNSYLVANIA

DISTRICT OFFICES: CINCINNATI • CHARLOTTE • CHICAGO • CLEVELAND • BOSTON • NEW YORK • ST. LOUIS • MINNEAPOLIS • NEW ORLEANS • DALLAS • HOUSTON • PITTSBURGH • PHILADELPHIA • SAN FRANCISCO

* ANNOUNCING a new ADAMSON UNITED.

This 28″ x 78″ Zee-type unit, shown without guards, is driven by universal spindles of the anti-friction bearing type, a significant improvement over the obsolete bronze slippers. The main bearings, which can be either anti-friction or bronze sleeve type, are lubricated by a circulating oil system. Individual sight gages and control valves are provided for controlling flow of lubricant to the main bearings and pull-back bearings.



...Zee-Type

PRECISION

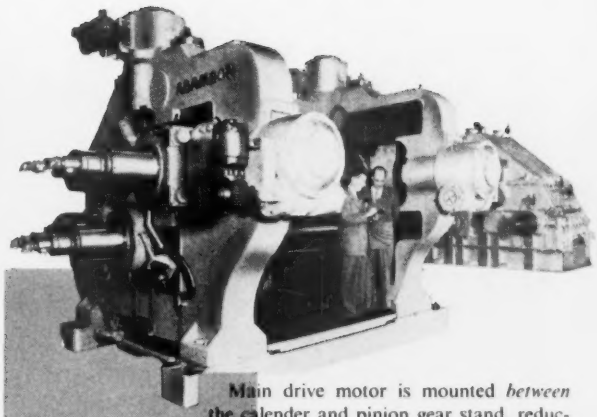
CALENDER

The new Adamson 4-roll calender is a completely modern Zee-type unit, especially designed for double-coating tire cord or producing two-ply laminated material. The improved features available on this unit greatly increase the accuracy of calendering operations, and assure a more uniform product with substantial savings in material. Higher production speeds can be obtained; and crown compensating equipment provides uniform transverse gage under varying conditions of operation.

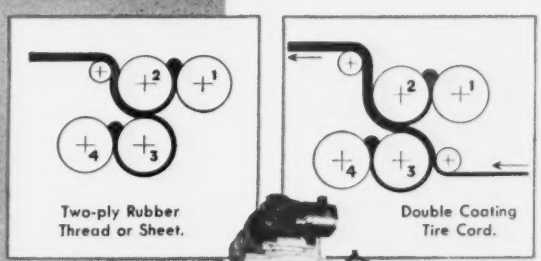
This high-speed unit incorporates a separate pinion gear stand which encloses all drive gears and connecting gears, driving the rolls individually through universal couplings. The peripherally drilled rolls are accurately controlled by a pressurized circulating water temperature regulation system.

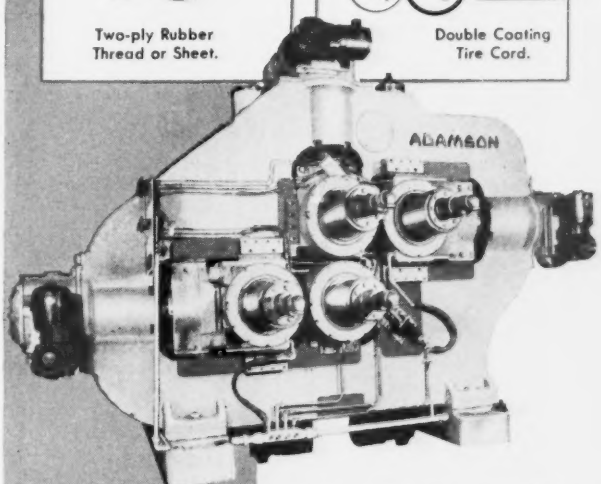
In addition to the unit shown, a modified calender, incorporating crossed axis equipment on only the #1 or the #4 roll is available for plastic film or sheeting. Adamson also manufactures a 24" Zee-type calender, along with a special 6-roll double Zee-type unit.

We invite your inquiries.

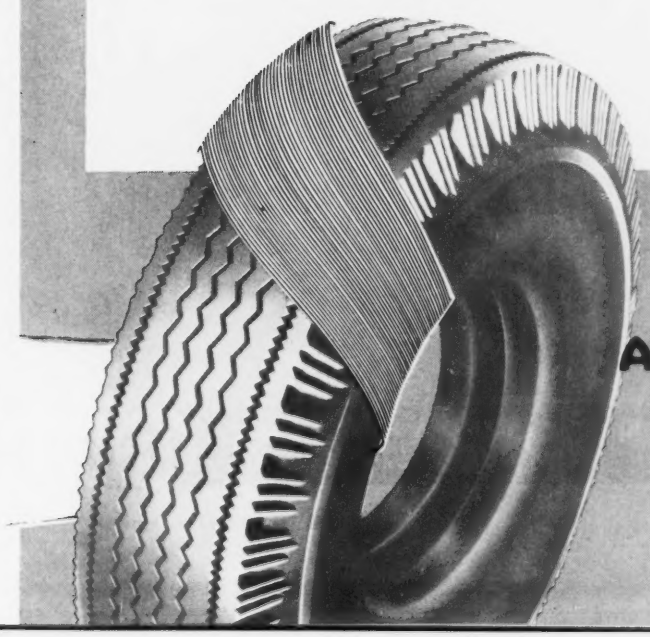


Main drive motor is mounted *between* the calender and pinion gear stand, reducing overall length significantly. Gage adjusting equipment is unitized construction, assuring positive alignment, with double enveloping worms and worm gears mounted in anti-friction bearings.





Both offset rolls (#1 and #4) are "crossed" in the vertical plane by motorized adjustments allowing operator to compensate for deflection of the rolls. The operator can add or subtract crown, in effect, by changing the amount of crossing of the two offset rolls with respect to the two stack rolls. Selsyn equipment and counters are provided for indicating the exact vertical position of each end of the crossed rolls.



ADAMSON UNITED COMPANY

730 Carroll Street • Akron 4, Ohio

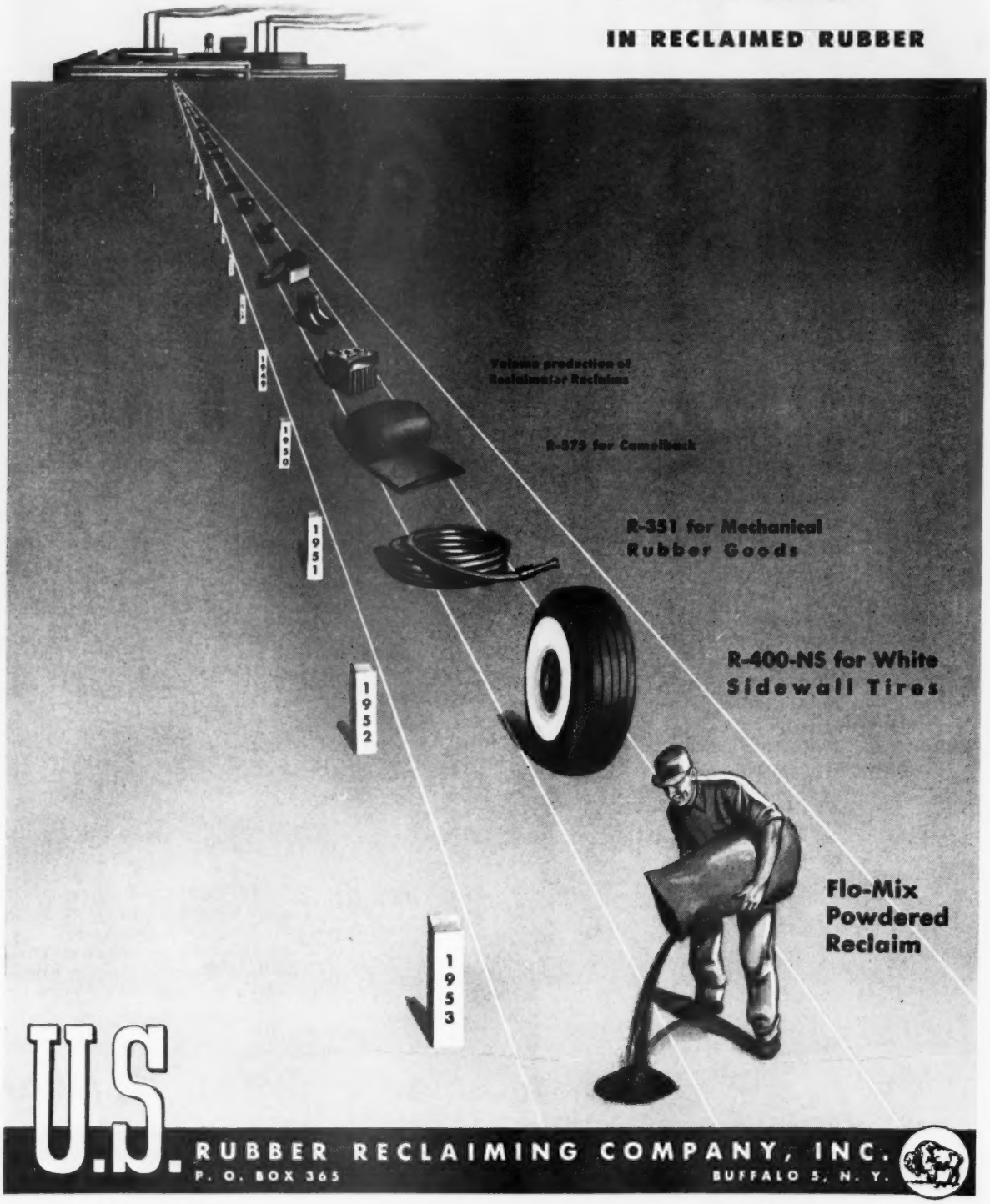
SALES OFFICES IN PRINCIPAL CITIES

Subsidiary of United Engineering and Foundry Company

Plants at: Pittsburgh • Vandergrift • New Castle • Youngstown • Canton

Our 71st Year

OF BEING **FIRST**
WITH THE **BEST**
IN RECLAIMED RUBBER



U.S. RUBBER RECLAIMING COMPANY, INC.
P. O. BOX 365 BUFFALO 5, N. Y.

ANY WAY YOU LOOK AT IT...

Photo by Constance Bannister

ANTIOXIDANT 2246*

is the most active, non-staining, non-discoloring antioxidant commercially available. Ideal for white and light-colored stocks. *Send for technical bulletin.*

*Trade-mark

SALES REPRESENTATIVES AND WAREHOUSE STOCKS

Akron Chemical Company, Akron, Ohio • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill.
H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

GLYCERIZED
(LIQUID CONCENTRATE)
LUBRICANT

PRODUCTION TESTS PROVE IT BEST

THE ALL PURPOSE EXTERNAL LUBRICANT

NATURAL SYNTHETIC AND RECLAIM STOCKS

DOES NOT INTERFERE WITH TACK OR KNIT

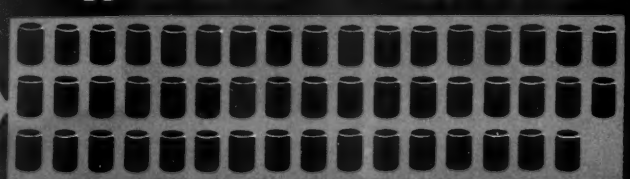
Prevents adhesion of hot rubber slabs when piled . . . banishes dust nuisance by replacing soapstone or talc . . . prevents sticking during cure of extrusions and flat pan coiled tubing . . . excellent release agent for molds, mandrels, air bags, belt drums . . . equally satisfactory for washing and finishing inner tubes; imparts satiny finish . . . greatly aids in the processing of insulated wire and cable. The Production Departments and Laboratories of many rubber manufacturers, through years of using GLYCERIZED, give ample proof of its outstanding qualities as a lubricant for natural, synthetic and reclaimed stocks.

Economical?

HIGHLY CONCENTRATED

1 drum makes up to 50 drums of working solution.

HERE'S WHY



Also Mfgrs. of

RUBBEROL AND **SYNTHOL** TWO OTHER FACTORY PROVED RUBBER PROCESSING AGENTS

QUALITY SINCE 1884

GENSEKE BROTHERS

RUBBER MATERIALS DIVISION

West 48th Place and Whipple Street Chicago 32, U.S.A

IS YOUR BATCH-OFF EQUIPMENT UP TO STANDARD?

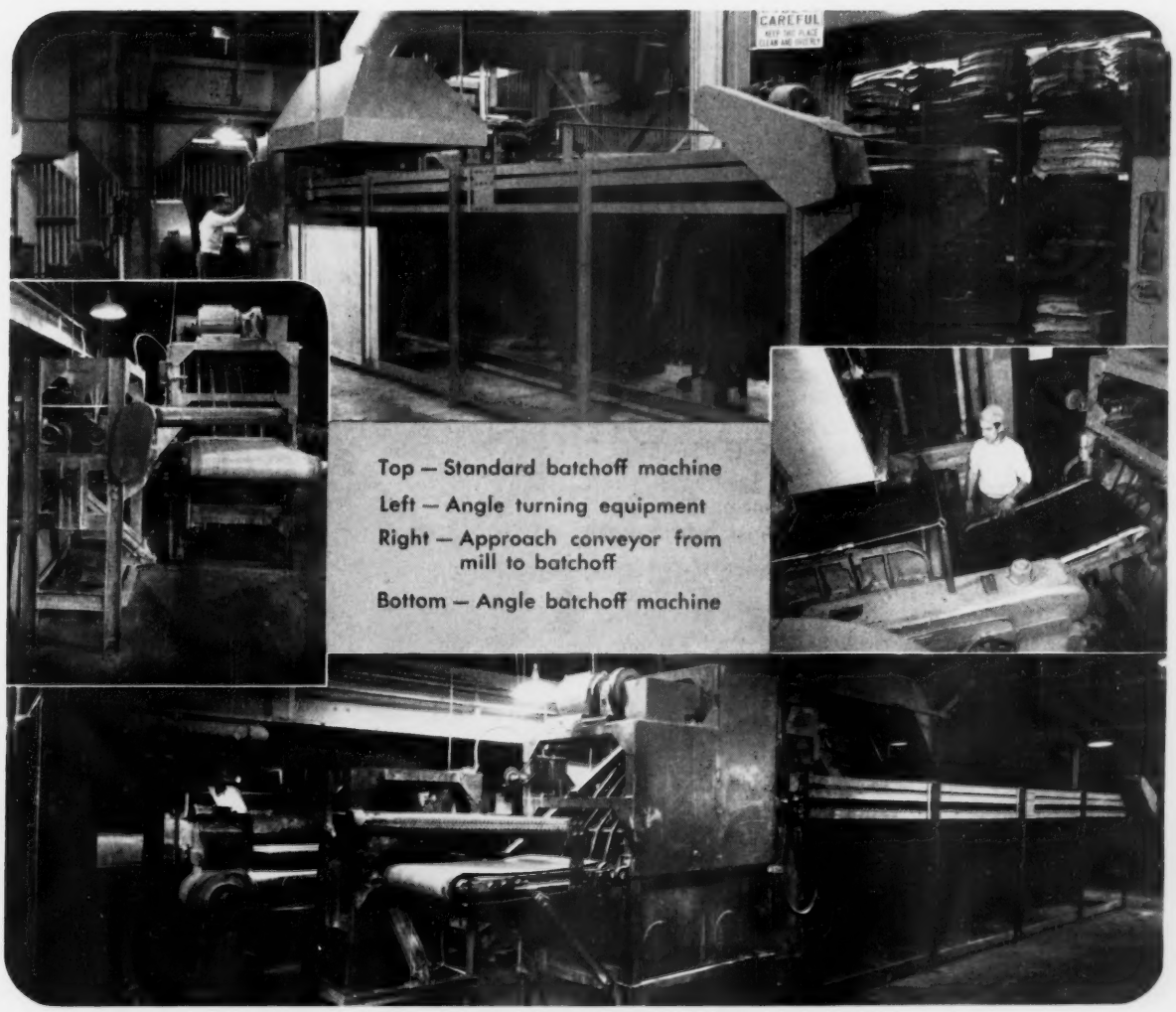
The Akron Standard designed Batch-Off Machine greatly adds to the efficiency of mill room processing operations. It will remove a continuous slab of stock from the Banbury dump mill in one to two minutes; that is, approximately a 400-lb. batch, depending upon the gravity of the stock. The machine has been designed principally for use in connection with the Banbury dump mill and measurably reduces the banbury cycle time when longer periods of time are required to batch-off by hand than the actual banbury cycle.

The removal of stock is by a continuous slab passing through a lubricant tank and on to the festoon rack properly spaced and automatically festooned.

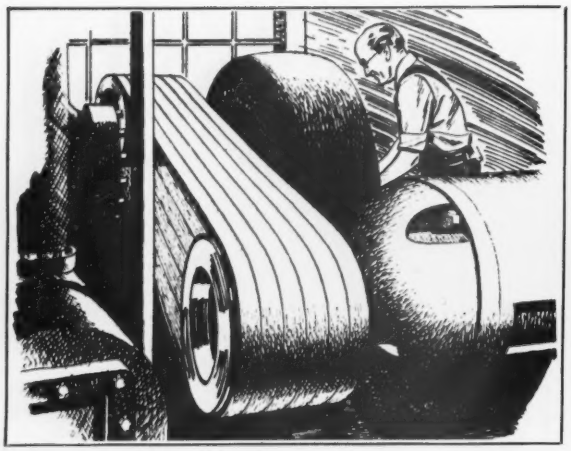
The original cost and upkeep are much cheaper than most types of equipment for doing the same type of work. A large number of these units are in daily operation throughout the rubber industry. Further details such as drawings showing layout of the machine with respect to Banbury dump mill will be gladly supplied upon request. Arrangements can be made with the present users of this equipment in your territory so that you see this unit in actual operation.

All of the big tire manufacturers as well as many of the small companies are using this equipment in some phase of their batching-off work. Therefore, we feel that in addition to saving you money on the original installation, we can reduce your labor costs for that particular processing operation.

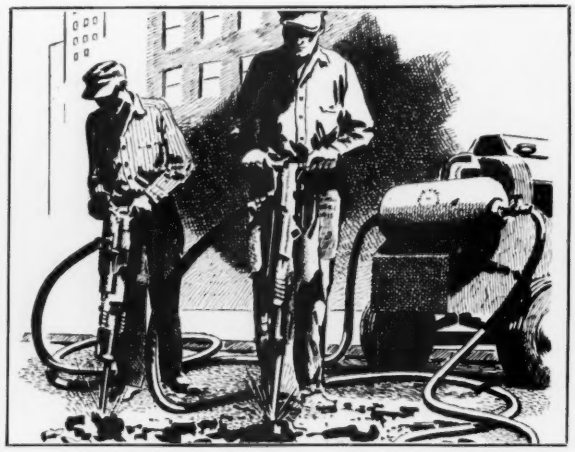
akron standard mold company
AKRON 5, OHIO



Top — Standard batchoff machine
Left — Angle turning equipment
Right — Approach conveyor from mill to batchoff
Bottom — Angle batchoff machine

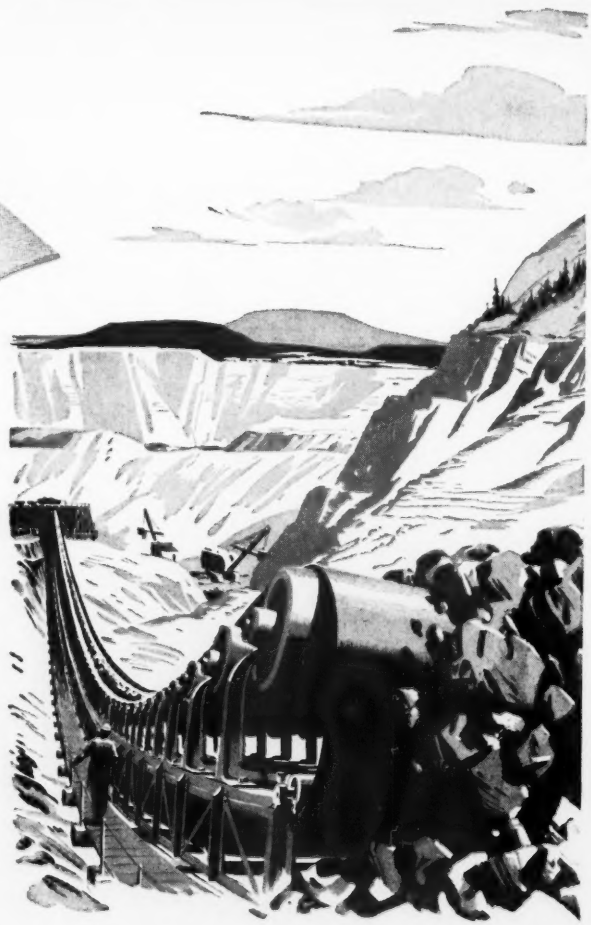


Wellington Sears has both cotton and synthetic fabrics to insure top performance and long life in products such as power transmission belts.



Shawmut Hose Duck is a soft, strong, plied-yarn fabric affording flexibility and good impregnation in a variety of hose applications.

YOU GET LONG SERVICE LIFE WITH WELLINGTON SEARS *BELTING DUCK*



Experienced industrial users specify Shawmut Belting Duck wherever exceptional strength, good adhesion, and bulking properties, *plus* economical cost, are needed, as in heavy-duty conveyor belts.

Product of an organization that has specialized in heavy-duty fabrics for over a century, this sturdy, pliable belting duck owes its strength to the carefully controlled construction and twist of the rugged plied yarns in the warp and filling.

With a complete line of cotton ducks for belting, hoses, and other mechanical rubber applications, Wellington Sears also has developed fabrics utilizing the unique properties of nylon, high-tenacity rayon, and other fibers.

If it's a rubber-and-fabric problem, talk it over with Wellington Sears.

Write for your free copy of "Modern Textiles for Industry" which includes pertinent information on rubber applications. Address: Wellington Sears Co., Dept. L- 65 Worth St., N. Y. 13.*

Superior Fabrics for the Rubber Industry

- Belting duck
- Hose duck
- Enameling duck
- Army duck
- Single and plied-yarn chafers
- Sheeting
- Airplane cloth
- Balloon cloth
- Nylon, high tenacity rayon, other synthetics and combinations.

Wellington Sears

A SUBSIDIARY OF WEST POINT MANUFACTURING COMPANY

FIRST In Fabrics For Industry

WELLINGTON SEARS COMPANY, 65 WORTH STREET, NEW YORK 13, N. Y.

OFFICES IN: ATLANTA • BOSTON • CHICAGO • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA • SAN FRANCISCO • ST. LOUIS

Stauffer

rubbermakers' sulphurs

any kind *any purpose*

CRYSTEX

85% Insoluble Sulphur

SULPHURS

TIRE BRAND (99.5% pure)
FLOWERS (30% insoluble)
CRYSTEX (85% insoluble)
TUBE BRAND (Refined)
SPECIAL PURPOSE GRADES

TIRE BRAND

General Use Sulphur

CHEMICALS

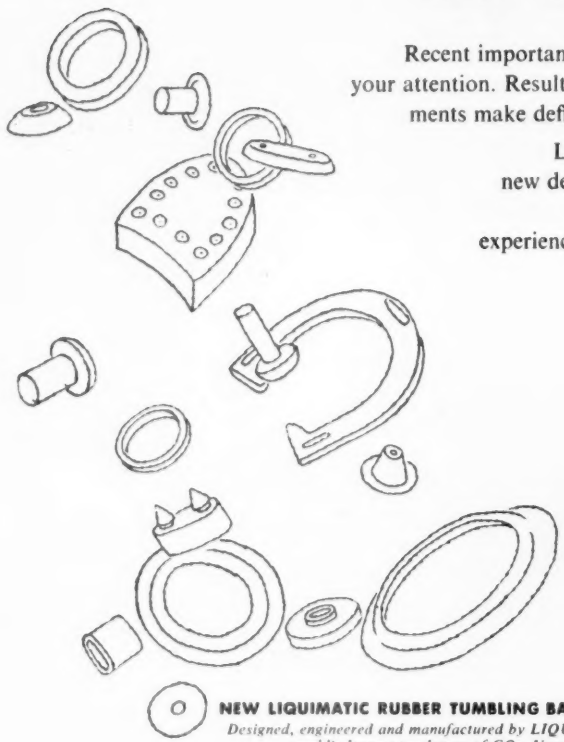
Caustic Soda
Carbon Tetrachloride
Carbon Bisulphide
Sulphur Chlorides

STAUFFER CHEMICAL COMPANY

380 MADISON AVE., NEW YORK 17, N. Y.

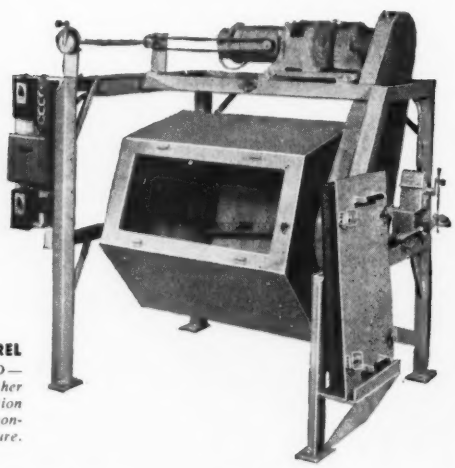
221 N. La Salle Street, Chicago 1, Illinois
326 So. Main Street, Akron 8, Ohio
824 Wilshire Boulevard, Los Angeles 14, California
636 California Street, San Francisco 8, California
North Portland, Oregon • P.O. Box 7222, Houston 8, Texas
Weslaco, Texas • Apopka, Florida

New Developments in CO_2 rubber tumbling Cut Deflashing costs



Recent important developments in CO_2 rubber tumbling deserve your attention. Results of intensive LIQUID research, these improvements make deflashing more efficient, economical and practical.

LIQUID engineers are anxious to discuss these new deflashing developments with your engineering or production personnel. These qualified, experienced experts are always available for consultation on any CO_2 or Dry Ice application. Just mail the coupon below.



NEW LIQUIMATIC RUBBER TUMBLING BARREL
Designed, engineered and manufactured by LIQUID—world's largest producers of CO_2. Uses either liquid CO_2 or Dry Ice. Heavy duty construction throughout. Stainless steel, 3" Rubatex insulated construction. Automatic control of time and temperature.

RED DIAMOND CO_2

IN WHICHEVER FORM YOU PREFER . . .

SOLID

RED DIAMOND Dry Ice

In the familiar 10" blocks.

LIQUID

Liquiflow

Tank truck to CO_2 receiver.

LIQUID also produces:
Gasweld Flame Welding and Cutting Equipment • Red Diamond Commercial Gases – Acetylene, Oxygen, Hydrogen and Nitrogen • A full line of Arc and Spot Welding Equipment and supplies

THE LIQUID CARBONIC CORPORATION
3100 SOUTH KEDZIE AVENUE • CHICAGO 23, ILLINOIS

THE LIQUID CARBONIC CORPORATION
3100 SOUTH KEDZIE AVENUE • CHICAGO 23, ILLINOIS

I would like more information on LIQUID's new developments in Rubber Tumbling.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Why do manufacturers of famous outerwear vinyl specify

Cabflex® Di-OZ

Because Cabflex® Di-OZ gives LOW TEMPERATURE PERMANENCE

The uniformly superior quality of Cabot's di-iso-octyl azelate imparts

Excellent Low Temperature Properties
Superior Water Resistance
Low Volatility
Good Hand

- Cabflex® Di-OP *di-iso-octyl phthalate*
- Cabflex ODP *iso-octyl decyl phthalate*
- Cabflex DDP *di-decyl phthalate*
- Cabflex DOCP *iso-octyl capryl phthalate*
- Cabflex Di-OA *di-iso-octyl adipate*
- Cabflex ODA *iso-octyl decyl adipate*
- Cabflex DDA *di-decyl adipate*
- Cabflex Di-OZ *di-iso-octyl azelate*
- Cabflex Di-BA *di-iso-butyl adipate*
- Cabol 100 *hydrocarbon oil plasticizer*

For samples and for further technical information address

CABOT PLASTICS CHEMICALS DIVISION

GODFREY L. CABOT, INC. 77 Franklin St., Boston 10, Mass.

The famous "All-Weather-Jacs" worn by the boys are manufactured by Central Sportswear Manufacturing Company, Boston

everything vinyl does...

it does beautifully with

TITANOX®

This is beauty with a practical side. Hundreds of durable vinyl products, including upholstery materials, drapes, and shower curtains look their best when properly pigmented. And the best beauty treatment for vinyl is TITANOX white titanium dioxide pigments.

In vinyl, TITANOX rutile and anatase titanium dioxides impart exceptional whiteness, brightness and opacity, and their compatibility with all types of natural and synthetic polymers helps maintain natural strength. These modern pigments maintain bright, clean tints and their fine, uniform particle size means easy grinding and mixing for complete dispersion throughout the polymer.

Consult with our Technical Service Department for assistance with your problems in pigmenting natural or synthetic polymers. Titanium Pigment Corporation, 111 Broadway, New York 6, N.Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7.
In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

®TITANOX
the brightest name in pigments

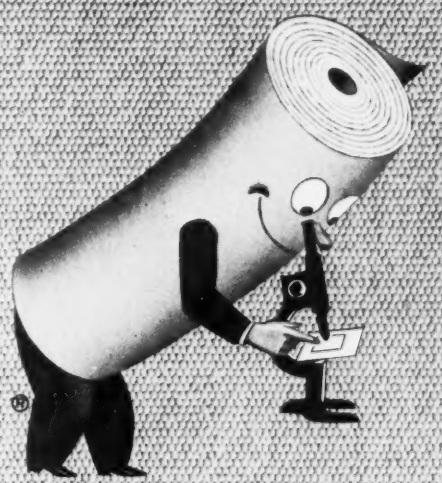
TITANIUM PIGMENT CORPORATION
Subsidiary of NATIONAL LEAD COMPANY

2315

UNIFORMITY

Makes The Big Difference In

INDUSTRIAL FABRICS



MT. VERNON FABRICS

Give You Greater Uniformity

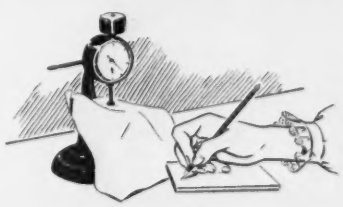
FABRICS ENGINEERED TO FIT YOUR NEEDS – Need adaptation of an existing fabric to your special purposes? Or creation of an entirely NEW fabric – cotton, synthetic or blend – to meet your specifications? Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

Mt. Vernon-Woodberry Mills

TURNER HALSEY COMPANY
Selling Agents

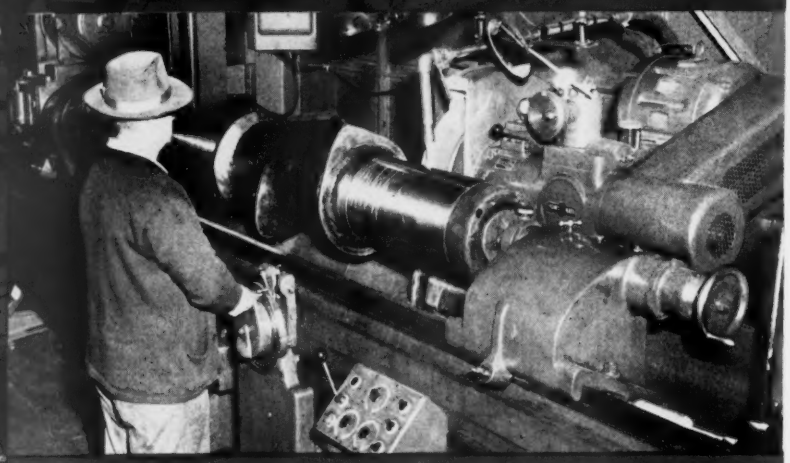
Main Office: 40 Worth St. • New York

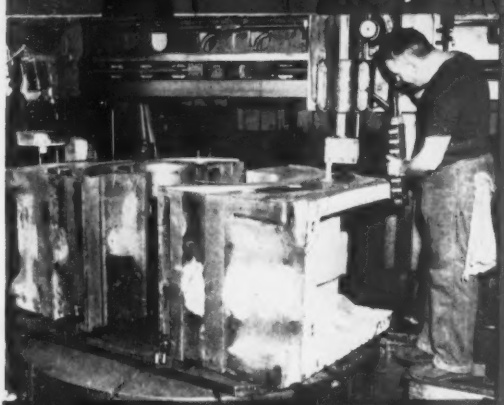
Branch Offices: Chicago • Atlanta • Baltimore • Boston • Los Angeles



One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products. Here fabric thickness after weaving is being gauged.

expert repair





we have
NEW IDEAS
which may interest you

● Banbury repairs require big facilities. Hale & Kullgren offer these facilities through association with The Aetna-Standard Engineering Company. This company installed more than $200,000 worth of special machine tools in their Warren, Ohio, plant for the specific purpose of repairing Banburys. These photos illustrate some of the actual Banbury repair work carried on in the big plant.

Repairing Banburys requires good craftsmanship, precision and accuracy. As specialists in metalworking for more than 50 years, Aetna-Standard has a superb reputation for expert work in the machinery business.

Hale & Kullgren adds the important know-how to Aetna-Standard's craftsmanship. H & K personnel have been associated with the rubber industry for as long as 30 years.

Much of the repair work requires building parts to the original. H & K have the patterns and can supply parts. In fact, most of them are carried in stock.

Call in Hale and Kullgren for fast, dependable Banbury repair service or rebuilding.

your inquiry...

Wire, write or phone Hale & Kullgren, Inc.
613 E. Tallmadge Ave., Akron 10, Ohio
Phone: FRANKLIN 6-7161

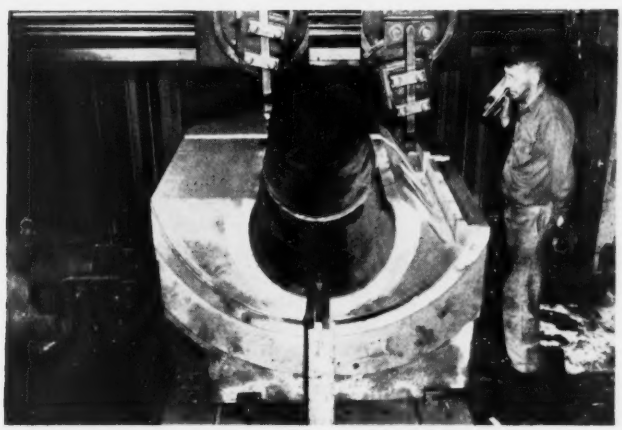
service on BANBURYS

OUR BIG SHOP HAS COMPLETE TOOLING FOR TOPNOTCH WORK

● When you need Banbury repair parts or rebuilding service, remember . . . you have a service practically at your back door.

The big Aetna-Standard plant at Warren, Ohio, sparkles with $200,000 worth of tools specifically installed for Banbury repair and rebuilding work.

When Hale & Kullgren announced their entry into the rubber and plastic machinery business three years ago, many friends said in effect — "I hope you intend to repair and rebuild Banburys. We need a service close to us."



In those three years, the Warren Plant has been busy with Banbury orders. Many midwest companies prefer the "close-to-home" service, so they can control progress of the work. They also like the personal treatment. Their maintenance men can follow the work closely in the shops and keep check on the progress of the work.

Parts do not offer a problem. Aetna-Standard has the patterns and build parts to the originals.

Another service in conjunction with repairing . . . Hale and Kullgren's engineers have been busy redesigning some of the basic Banbury parts. Several new ideas have been developed which might interest you. These changes do not interfere with the interchangeability. For example, one idea gives better control of leakage in the mixing chamber. That problem has been a bugaboo for many years in the Banbury business.

For expert service on your Banburys, remember the midwest service offered by Hale & Kullgren, specialists in designing and building rubber and plastic machinery.

We have patterns and can supply any part . . . We stock most of them

A SWAP SERVICE

In many cases, for quick service, a swap of parts can be made. You receive a rebuilt body with all parts up to standard and guaranteed. This swap of parts cuts your down time to a minimum.

SALES and ENGINEERING by

HALE AND KULLGREN INCORPORATED

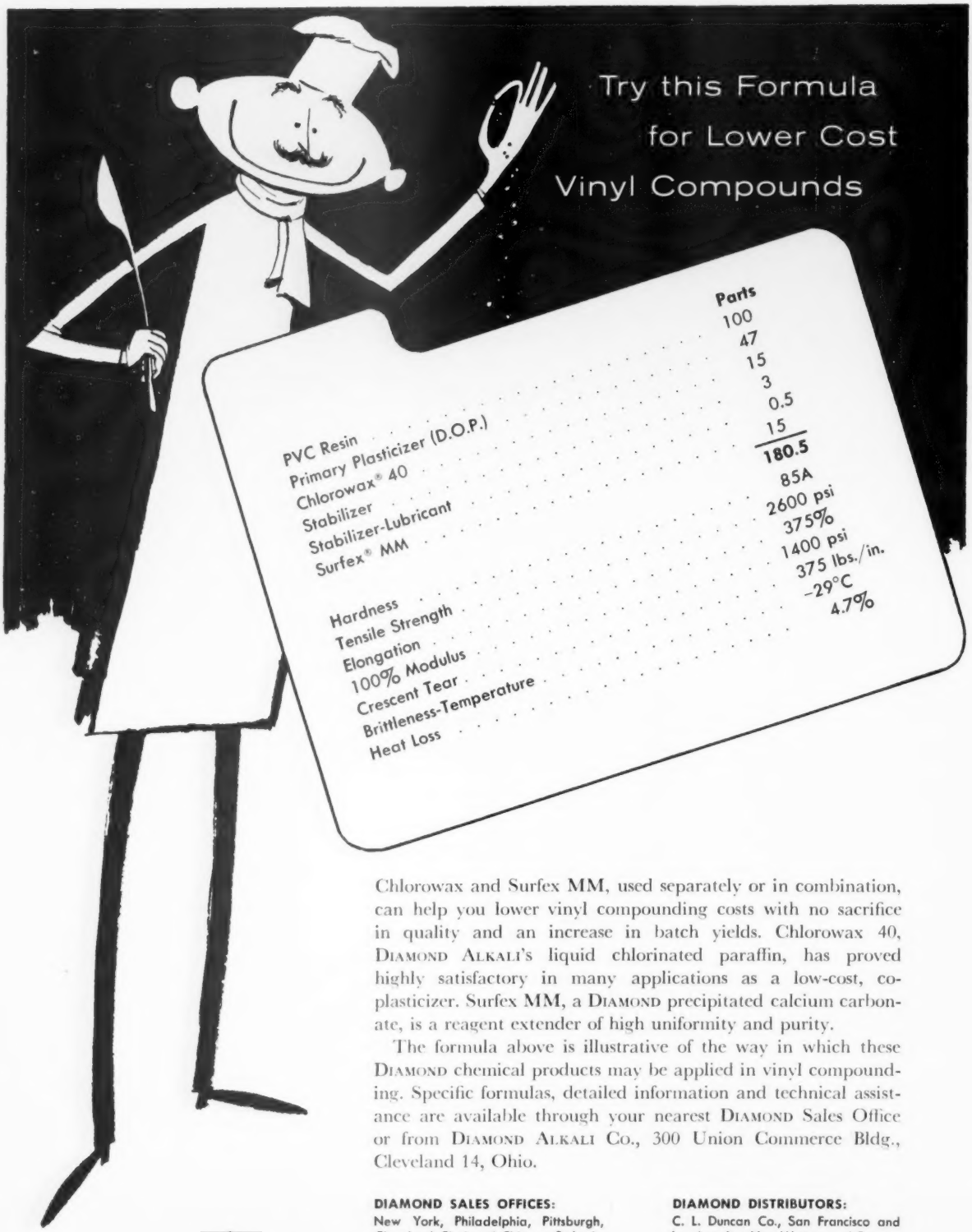
P. O. BOX 1231 • AKRON, OHIO

MANUFACTURING by

Aetna-Standard

THE AETNA-STANDARD ENGINEERING CO
PITTSBURGH, PA

Plants in Warren, Ohio
Ellwood City, Penna.



Chlorowax and Surfex MM, used separately or in combination, can help you lower vinyl compounding costs with no sacrifice in quality and an increase in batch yields. Chlorowax 40, DIAMOND ALKALI's liquid chlorinated paraffin, has proved highly satisfactory in many applications as a low-cost, co-plasticizer. Surfex MM, a DIAMOND precipitated calcium carbonate, is a reagent extender of high uniformity and purity.

The formula above is illustrative of the way in which these DIAMOND chemical products may be applied in vinyl compounding. Specific formulas, detailed information and technical assistance are available through your nearest DIAMOND Sales Office or from DIAMOND ALKALI Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

DIAMOND SALES OFFICES:
New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, St. Louis, Memphis, Houston.

DIAMOND DISTRIBUTORS:
C. L. Duncan Co., San Francisco and Los Angeles; Van Waters and Rogers, Inc., Seattle and Portland, U.S.A.; Harrisons & Crosfield (Canada) Ltd.

DIAMOND ALKALI CHEMICALS ®

DIAMOND ALKALI COMPANY
CLEVELAND 14, OHIO

Excellent for

Sidewall, Carcass, Breaker, Cushion, Undertread and Bead Stock Compounds

CABOT

®Sterling·V

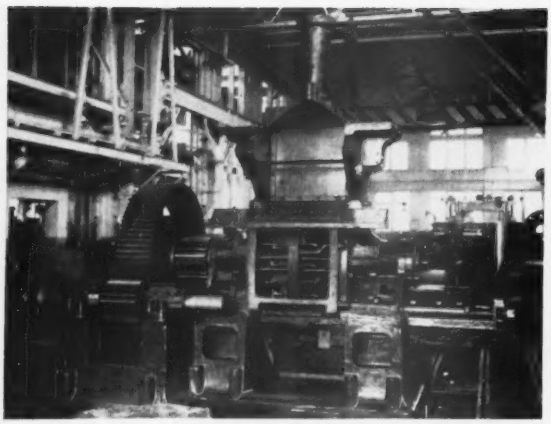
(for VERSATILE)

LOW COST OIL FURNACE CARBON BLACK

Sterling V gives

Good Processing Properties
Low Heat Buildup
Hot Tensile Strength
Hot Tear Resistance

GODFREY L. CABOT, INC.
77 FRANKLIN ST., BOSTON 10, MASS.

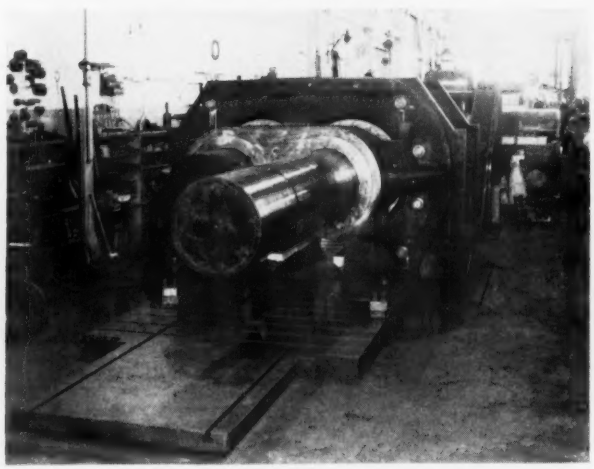


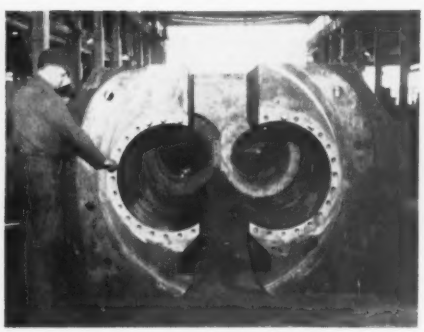
Accurate, Thorough and with Dispatch— INTERSTATE BANBURY REBUILDING

SAVES YOU TIME AND TROUBLE

↑ Z9 Banbury rebuilt complete by INTERSTATE and reassembled in our plant for running in.

→ Z27 Banbury body rebuilt by INTERSTATE, reassembled and mounted on bed plate in our plant for customer to see it running.





Z27 Side Jackets rebuilt by INTERSTATE. Jackets bored out and 2-inch high carbon steel sleeves inserted.

IT WILL PAY you to have your worn Banbury body rebuilt here. Rotors, side jackets, rings, bearings, end frames, thrust nuts, door top, connecting gears—ALL are worked over carefully by skilled, experienced Banbury men. Each worn part is accurately restored to its original size and contour and all wearing surfaces thoroughly hard-surfaced. New parts are used where necessary. The body is reassembled, painted and returned to you — good as new.

Our plant facilities handle every size of Banbury. We have rebuilt bodies for sale or interchange and we also have rebuilt parts for all sizes or can fabricate them new.

When you have a Banbury that needs attention — give us a call. It will cost you nothing to have an estimate. One of our engineers will visit your plant and inspect your installation at your request.

SERVING THE IWS RUBBER INDUSTRY

EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING

INTERSTATE WELDING SERVICE

Main Offices — Metropolitan Bldg., AKRON 8, OHIO Phone JE 5-7970

Neville Chemicals

for improving **rubber** products

Neville's years of experience with the problems of rubber manufacturers have produced a superior line of resins and oils for greater ease and uniformity in rubber processing.

Neville Coumarone Resins have long aided in processibility and pigment dispersion with improved physicals including heat stability, tensile and tear. They insure highest quality and maximum economy of production.

Let us help you select the right grade for your purpose.

NEVILLE

NEVILLE CHEMICAL CO.
PITTSBURGH 25, PA.
Plants at Neville Island, Pa., and Anaheim, Cal.

R-52

- a highly reinforcing white pigment
- excellent resistance to scorch
- good dispersing characteristics

ZEOLEX 23*

*Microlitic Zeolite

PHYSICAL PROPERTIES:

pH (20% water slurry)	10-11
Form	Dry Powder
Handling Precautions	None (non-toxic)
Specific Gravity	2.10
Screen Residue (325 mesh)	0.1% Maximum
Free Moisture (Maximum)	5%

PROMPT SHIPMENTS AVAILABLE FROM OUR CHEMICALS DIVISION PLANT AT HAVRE DE GRACE, MD.

J. M. HUBER CORPORATION, 100 PARK AVENUE, NEW YORK 17, N. Y.

HUBER

Manufacturers of: Channel Black, Furnace Black, Rubber Clays, Rubber Chemicals

RUBBER AGE

One of the World's Outstanding Rubber Journals

VOLUME 74
NUMBER 6

M. E. LERNER
Editor

B. J. KOTSHER
Associate Editor

KENNETH T. CORELL
Production Manager

ELLA MAY DARRIN
Circulation Manager

CHARLES T. JANSEN
Advertising Manager

PETER P. PINTO
General Manager

MICROFILMS

Microfilm copies of complete volumes of RUBBER AGE are available from University Microfilms, 313 N. First St., Ann Arbor, Mich.

Also Publishers of:

RUBBER RED BOOK
Directory of the Rubber Industry Published Biennially

ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D. For Years 1935-1939

LATEX IN INDUSTRY
By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
(Out of Print)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932, to January, 1937; rubber derivatives to January, 1937.

CONTENTS FOR MARCH, 1954

Investigation of Elastomer Steam Hose for Use with Saturated Steam at a Pressure of 200 psi—*By S. A. Eller* .. 899

The Permeability of Different Elastomers to CO_2 Using Carbon-14—*By A. D. Kirshenbaum, A. G. Streng, and W. B. Dunlap, Jr.* 903

Report on Accidents Involving Carbon Tetrachloride 908

Division of Rubber Chemistry, A.C.S., Meets in Louisville on April 14-16, 1954: Abstracts of Papers 909

Coatings Protect Against Abrasion and Corrosion 913

Importance of Rubber Hose for Material Handling — *By J. A. Muller* 914

Glossary of Terms Used by the Mechanical Rubber Goods Industry 915

Four Measures for Properly Guarding Conveyors 935

●

REGULAR DEPARTMENTS

Book Reviews	978	Los Angeles News	960
Canadian News	958	Names in the News	946
Chemical Prices	*	New Goods	966
Classified Ads	997	New Equipment	972
Coming Events	944	Obituaries	962
Editorials	936	Rubber, Cotton Markets..	984
Financial News	956	Statistics	988

* Appears every other month

●

Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC.

Printing Office,
East Stroudsburg, Pa.

Editorial and Advertising Offices,
250 West 57th St., New York 19, N. Y.

New England Representative—F. ROYAL CAREY, P.O. Box 133, Providence, R.I.

Midwestern Representative—Larry M. Lyons, 549 West Washington St., Chicago 6, Ill. Phone: Central 6-0545.

News Correspondents—CARL S. HOGLUND, 5107 Telegraph Road, Los Angeles 22, Calif.—Phone: ANgelus 2-0117. PHIL GLANZER, Tivoli Theatre Bldg., Toronto 1, Canada.

Entered as Second Class Matter, October 20, 1933, at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $5.00 a year; Canada, $5.50; Foreign, $6.00. Single copies up to 3 months old, 50 cents; over 3 months old, 75 cents. Telephones: COlumbus 5-2923, 5-2924.

Contents Copyrighted 1954 by the Palmerton Publishing Company, Inc.

Indexed in Industrial Arts Index and Engineering Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

SUNPROOF protected rubber gives ozone the "air"!

Now you too can prevent the damaging attack of ozone that causes cracking and frosting in farm tires and other rubber products, and severely shortens their service life.

SUNPROOF®—a specially developed blend of waxes— is an extremely effective inhibitor of static atmospheric cracking and frosting that gives ozone protection *all year 'round.*

Specifically recommended for tires for farm implements and earth-moving equipment, SUNPROOF also extends the useful life of auto, truck, and airplane tires, wire jacketing and insulation, mechanical goods, footwear, clothing, and a variety of rubber sundries.

Available in 5 different blends—SUNPROOF's JUNIOR, 713, REGULAR, IMPROVED, and SUPER—it melts and disperses thoroughly during mixing, is non-discoloring, and has no effect on rate of cure.

Make sure you're giving *your* natural rubber, GR-S, neoprene, and nitrile rubber stocks such as PARACRIL®, the protection they need. For further information, write on your letterhead to the address below.

Naugatuck Chemical

103 ELM STREET
NAUGATUCK, CONNECTICUT

Division of United States Rubber Company

IN CANADA: NAUGATUCK CHEMICALS DIVISION • Dominion Rubber Company, Limited, Elmira, Ontario

RUBBER CHEMICALS • SYNTHETIC RUBBER • PLASTICS • AGRICULTURAL CHEMICALS • RECLAIMED RUBBER • LATICES

RUBBER AGE

Vol. 74, No. 6 MARCH, 1954

Investigation of Elastomer Steam Hose for Use with Saturated Steam at a Pressure of 200 PSI

By S. A. ELLER

Rubber Technologist, Rubber Development Section, Material Laboratory, New York Naval Shipyard, Brooklyn 1, N. Y.

HIGH pressure flexible steam hose is used in Naval Shipyards for supplying steam to vessels during temporary berthing periods or for such periods of time as the vessel may be undergoing repair work. This steam is used aboard the vessel for heating living spaces, for cooking, and for operating machinery such as pumps and winches. In addition, flexible steam hose is required for conveying steam to sites in drydocks where it is used in heating hot plastic anti-fouling paint and for vulcanizing rubber anti-corrosive coatings onto propellers, struts and rudders of Naval vessels.

The high pressure flexible steam hose used in Naval Shipyards for the above-mentioned purposes is subjected to extremely severe service conditions. For example, while conveying steam of relatively high pressure and temperature the hose is: (a) Constantly exposed to all types of weather conditions since work on Naval vessels must proceed regardless of climatic conditions; (b) Subjected to flexing as a result of movement of the vessel due to waves and tides; (c) Subjected to crushing action between the vessel and the dock and to damage by vehicles, and (d) Subjected to impact blows from falling objects.

In view of these severe service conditions, it is apparent that elastomer type of steam hose will fail prematurely unless it is specifically designed for Shipyard service. Since it is imperative that suitable steam hose be provided for use in Naval Shipyards, the Material Laboratory was requested by the Bureau of Ships to develop testing procedures for investigating the suitability of commercially available elastomer steam hose and to encourage the development of improved hose, utilizing braided steel wire in lieu of fabric reinforcement.

Hose Samples

The Material Laboratory obtained 14 types of commercially available high pressure elastomer steam hose from nine manufacturers. Each sample of hose was 10 feet long and was fitted at both ends with couplings of the "Boss" type or equivalent design. Information regarding the type of reinforcement used in the hose and the basic elastomeric materials used in compounding the cover, friction and tube materials are tabulated in Table I.

Note: The opinions or assertions contained herein are the private ones of the author and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

TABLE I—TYPE OF REINFORCEMENT AND BASIC ELASTOMERIC MATERIALS USED

Code	Reinforcement	Basic Elastomeric Ingredient Cover	Friction	Tube
A-1	1 layer of braided steel wire and 1 layer of braided cotton-asbestos	Natural	Natural	Natural
A-2	2 layers of braided steel wire and 1 layer of braided cotton-asbestos	Natural	Natural	Natural
A-3	4 layers of braided cotton-asbestos	Natural	Natural	Natural
B-1	2 layers of braided steel wire	Natural	Natural	Natural
C-1	3 layers of braided glass cord	Natural	Natural	Butyl
D-1	2 layers of braided glass cord and 1 layer of braided cotton	Neoprene	Natural	Natural
D-2	2 layers of braided cotton-asbestos and 1 layer of braided cotton	Neoprene	Natural	Natural
E-1	6 layers of cotton duck	Buna S	Natural-Buna S	Natural-Buna S
E-2	2 layers of braided steel wire and 1 layer of cotton-asbestos	Buna S	Natural	Natural
F-1	3 layers of braided cotton-asbestos	Natural	Natural	Natural
G-1	2 layers of braided steel wire and 1 layer of braided glass cord	Natural	Natural	Natural
G-2	3 layers of braided cotton-asbestos	Natural	Natural	Natural
H-1	1 layer of braided asbestos over tube, 2 layers of braided steel wire and 1 layer of braided cotton	Natural	Natural-Buna S	Natural-Buna S
I-1	2 layers of braided steel wire and 1 layer of braided cotton-asbestos. Innermost layer of wire in direct contact with steam	Neoprene	Natural	Natural

Notes: Samples are identified by code letters to maintain commercial confidence. The nominal I.D. of hose is ¼-inch for samples listed, except Sample F-1 which has a nominal I.D. of 1 inch. The term "natural" is used for natural rubber.

Simulated Service Tests

To evaluate the ability of steam hose to withstand flexing action while conveying steam, the Material Laboratory devised apparatus to flex (bend) a length of hose while it was conveying saturated steam at a pressure of 200 psi. The flexing device consists essentially of an oscillating arm driven by an electric motor through a rack and gear device. The arrangement is such that the arm oscillates through an angle of 45 degrees on either side of the vertical position at the rate of 830 ± 15 cycles per hour. One end of the hose sample is connected to the steam inlet pipe and then the hose is passed up over the flexing machine and secured to the oscillating arm, leaving a 4 foot long connecting loop for flexing. The hose is then passed downward between the flexing and retaining rollers and the other end connected to a vent. A diagrammatic sketch of the test set-up is shown in Figure 1.

The flexing apparatus was located near a source of steam at a pressure of 430 psi and a temperature of 750° F. This steam was first reduced in pressure and then desuperheated so that saturated steam at a pressure of 200 psi (388° F) was available at the inlet end of the hose. An over-all view of the apparatus (Figure 2) shows the steam gages, valves and hose flexing apparatus (contained in the transite enclosure in order to protect personnel from steam leaks). The pressure and temperature conditions of steam conveyed by the hose were measured and the general condition of the hose was observed visually at ½ hour intervals during the test. Each length of hose was flexed as shown in Figure 3 for about 7½ hours every working day for a total flexing period of 56 hours, unless the test was terminated earlier due to failure (steam leakage) of the sample.

Since steam hose may be subjected to impact and crushing loads in service, the Laboratory devised special equipment for simulating these service conditions while the hose was conveying saturated steam at a pressure of 200 psi. The plunger of a Mead air press was fitted with a semi-cylindrical foot having a radius of 1 inch and measuring 3 inches long. When the plunger foot was

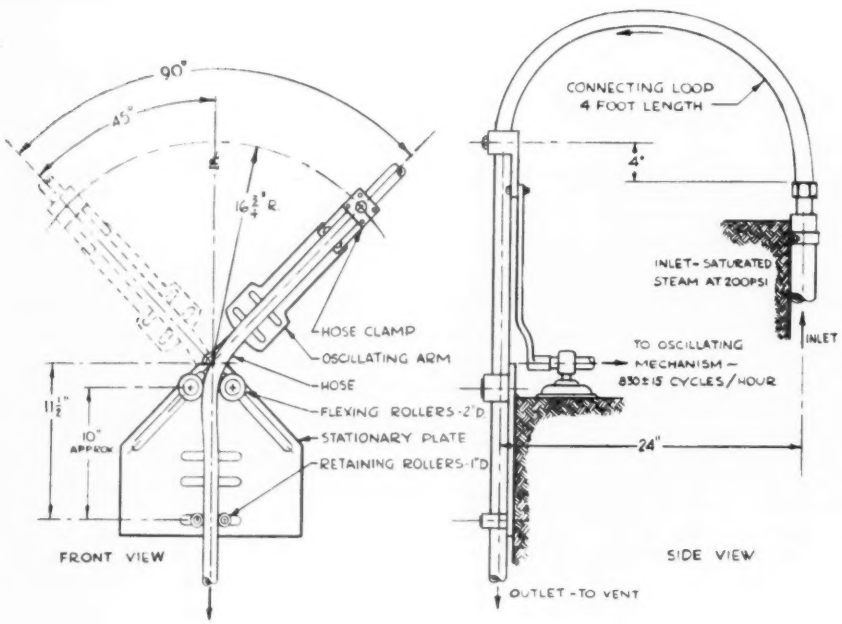


FIG. 1—Diagrammatic sketch of steam hose flexing apparatus.

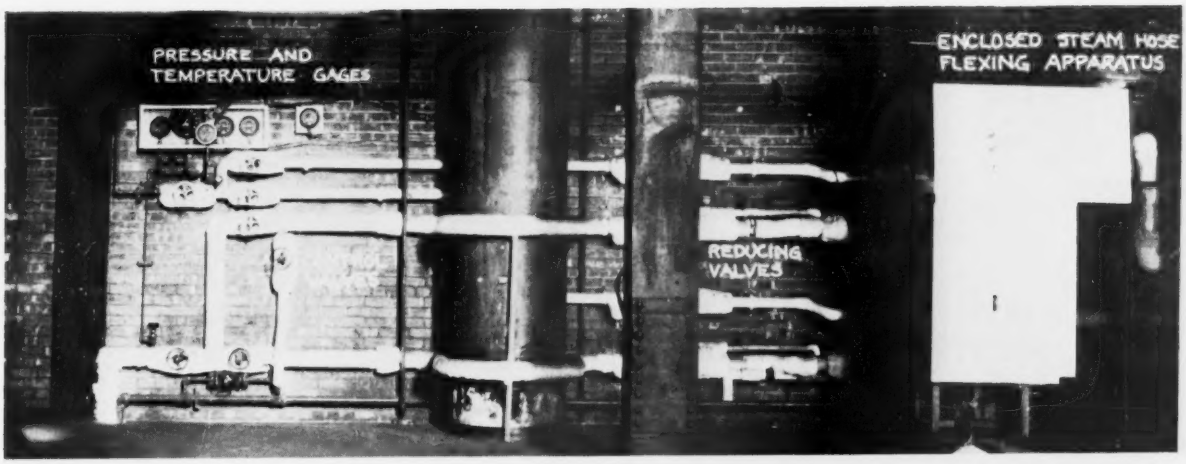


FIG. 2—View of gages, valves and enclosed steam hose flexing apparatus.

in neutral position it was about 1½ inches above the hose. The anvil on which the hose was positioned measured 6 inches square and was fitted with 4 adjustable guides for holding the hose in proper position during an impact and crushing test. A view of the apparatus is shown in Figure 4.

Each sample of steam hose that did not burst during the 56-hour flexing test was positioned on the anvil of the press and conditioned by conveying saturated steam at a pressure of 200 psi for one hour. Immediately following this conditioning period and while the hose was still conveying saturated steam, the air supply to the press was quickly increased to 90 psi, thereby causing the plunger to move downward under a total load of 2,520 pounds to shock and crush the hose as illustrated in Figure 5. The 90 psi air pressure was maintained for 5 seconds, after which the air pressure was released, the plunger then automatically returning to its original position. The hose was permitted to recover for 60 seconds and then the impact and crushing test was repeated at the same place on the hose. This test, consisting of two impact and crushing blows, was performed at three locations on the hose as follows: (1) One foot from the steam inlet end of the hose; (2) At a location on the hose near the flexing rollers (with respect to the position of the hose on the flexing machine), and (3) Two feet from the outlet end of the hose.

The lengths of hose that withstood the 56-hour flexing test and the impact and crushing test were replaced on the flexing machine and subjected to flexing for 7 more hours while conveying saturated steam at 200 psi pressure, at which time the tests were stopped. Thus the lengths of hose that withstood the simulated service tests had conveyed saturated steam at a pressure of 200 psi for a total period of 64 hours, consisting of: (1) Flexing for 56 hours, (2) Conditioning for 1 hour prior to the impact and crushing test, and (3) Flexing for an additional 7 hours.

Results

The results obtained on the 14 types of steam hose samples after the above described simulated service investigations are tabulated in Table II. The type of reinforcement used in the respective lengths of hose is retabulated in Table II, thus providing a basis for comparison of the effect of the steam on the hose samples. The first six samples listed in Table II burst during the simulated service tests and are arranged in accordance with their relative merit (from worst to best). The re-

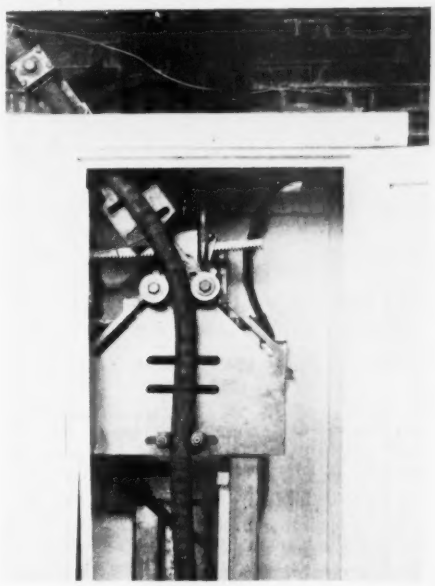


FIG. 3—Steam hose flexing apparatus.

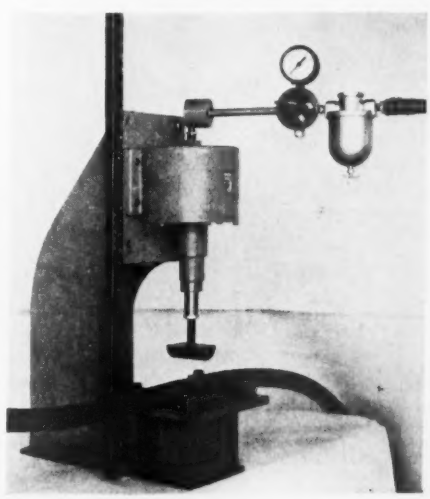


FIG. 4—Over-all view of Mead air press.

TABLE II—RESULTS OBTAINED ON STEAM HOSE SAMPLES AFTER SIMULATED SERVICE TESTS

Code	Time Required for Sample to Leak Steam (hours)	Type of Reinforcement
E-1	2½	6 layers of cotton duck
F-1	5¾	3 layers of braided cotton-asbestos
D-1	9	2 layers of braided glass cord and 1 layer of braided cotton
A-3	12½	4 layers of braided cotton-asbestos
C-1	38¼	3 layers of braided glass cord
G-2	57½	3 layers of braided cotton-asbestos
D-2	64 (1) (2)	2 layers of braided cotton-asbestos and 1 layer of braided cotton
A-1	64 (1) (3)	1 layer of braided steel wire and 1 layer of braided cotton-asbestos
B-1	64 (1) (4)	2 layers of braided steel wire
A-2	64 (1) (5)	2 layers of braided steel wire and 1 layer of braided cotton-asbestos
E-2	64 (1)	2 layers of braided steel wire and 1 layer of cotton-asbestos
I-1	64 (1) (6)	2 layers of braided steel wire and 1 layer of braided cotton-asbestos
G-1	64 (1) (7)	2 layers of braided steel wire and 1 layer of braided glass cord
H-1	64 (1) (8)	1 layer of braided asbestos over tube, 2 layers of braided steel wire and 1 layer of braided cotton

Notes: (1) Hose did not leak steam. The flexing test was discontinued after the 64-hour period. (2) There were two small slits in the hose cover. (3) There were a few transverse cracks in the cover. In addition, the tube material was pitted as shown in Figure 6. (4) 10 blisters were formed beneath the hose cover. (5) Hose was crushed slightly at place of impact. In addition, the tube material was pitted as shown in Figure 6. (6) There were transverse cracks in, but not through, the cover. (7) There were numerous deep transverse cracks in the cover. (8) Cover was separated for a distance of 3 inches near the inlet end of hose.

maining eight samples are also tabulated, but without regard to merit as none of these samples leaked steam during the tests.

Conclusions

Elastomer steam hose having at least one layer of braided steel wire reinforcement is superior to hose having only non-metallic types of reinforcement, such as cotton-duck, asbestos-cotton, or glass cord. This is evidenced by the fact that none of the 7 lengths of hose having steel wire reinforcement leaked steam during the 64-hour simulated service tests, whereas 6 of the 7

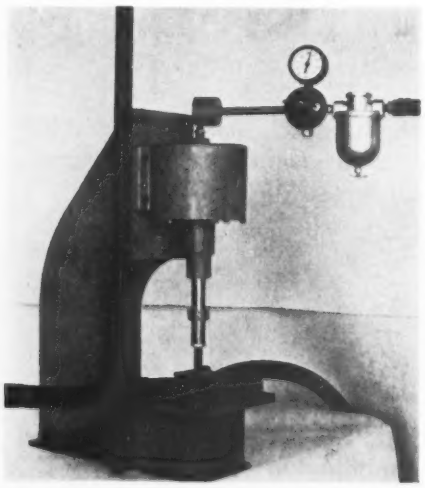


FIG. 5—Over-all view of Mead air press showing crushed condition of steam hose.

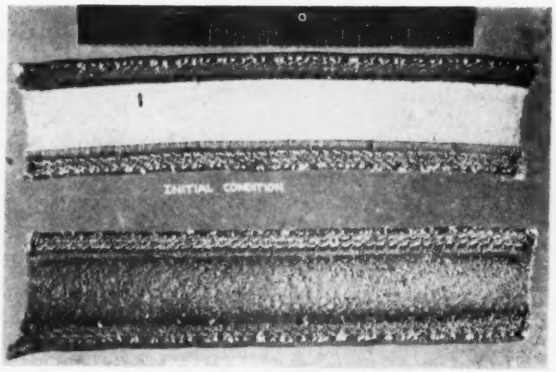


FIG. 6—Cross-sections of Code A steam hose showing comparison between tube in the initial condition and after conveying saturated steam at 200 psi pressure for 64 hours.

lengths of hose made with non-metallic reinforcement burst before the tests were completed.

In addition to the apparent longer service life of elastomer steam hose having braided steel wire reinforcement, this type of hose is safer to use. It is believed that, if wire-reinforced steam hose should fail in service, the steam leakage would be relatively small and would not immediately result in a hazardous condition. In contrast to this, a failure of elastomer steam hose made with non-metallic types of reinforcement only could result in a longitudinal splitting of the hose and the consequent release of large volumes of high pressure steam, thereby endangering nearby personnel.

Pitting of a steam hose tube, such as illustrated in Figure 6, is undesirable since the eroded particles of the tube material may be carried by the steam and might eventually lodge in regulators or other equipment of vessels being supplied with steam through the hose.

The basic requirements of elastomer steam hose as derived from Shipyard service experience are that the hose should have at least one layer of braided steel wire reinforcement, exhibit good flexibility and that the couplings be properly located and secured in place on the hose.

Summary

Equipment and procedures have been developed for evaluating the suitability of competitive makes of elastomer steam hose. Based on the results of the investigation it was found that elastomer steam hose made with at least one layer of braided steel wire reinforcement is more serviceable and safer than hose containing non-metallic reinforcement only. Although the investigation was conducted using saturated steam at a pressure of 200 psi (388° F.), the Bureau of Ships, as a safety precaution, does not recommend the use of elastomer steam hose at steam pressures over 150 psi nor for steam temperatures exceeding 365° F.

This article was prepared in order to inform manufacturers and consumers of steam hose about the results of an investigation on elastomer steam hose conducted at the Material Laboratory, New York Naval Shipyard. The information contained herein should not be interpreted as an endorsement by the Navy Department of specific items or uses of equipment.

ACKNOWLEDGMENT

The author desires to thank Mr. C. K. Chatten, Head of the Rubber Development Section, for his advice and encouragement in preparing this article.

The Permeability of Different Elastomers to CO_2 Using Carbon-14

By A. D. KIRSHENBAUM and A. G. STRENG
Research Institute of Temple University, Philadelphia, Penna.
and W. B. DUNLAP, Jr.
Lee Rubber and Tire Corporation, Conshohocken, Penna.

IT is well known that rubber membranes are permeable to gases and that the rate of permeation is specific for a given gas and rubber *(1)*. These differences in permeability are of great technical importance especially in balloons and inner tubes. The permeability of gases through rubber is due to the dissolving of the gas molecules into one side of the rubber membrane followed by the diffusion of the gas through the membrane and evaporation of the gas on the other side *(2, 4)*.

In the past, the relative permeability of gases through elastomers for inner tubes was mainly determined by measuring the pressure loss in the tire after a long period of time. More accurate measurements were made on sections of the inner tube using a permeability cell with a pressure gauge *(3, 5, 6, 7)*. In these tests the gas liberated was collected and measured by a gauge, still requiring several days for accurate measurements. The method described in this paper makes use of radioactive carbon (carbon-14) and requires from 4 to 15 hours to determine the actual permeability, depending upon the temperature for gases of elements having radioactive isotopes. The higher the temperature the shorter the time required for the elastomers studied. A qualitative comparison of the permeability of the same gas for different elastomers can be obtained in 2 to 3 hours. Using this isotopic technique one can also obtain the solubility and the rate of evaporation of the gas in the various rubbers simultaneously with the permeability.

Note: This paper was presented before the Division of Rubber Chemistry, American Chemical Society, Buffalo, N. Y., October 31, 1952.

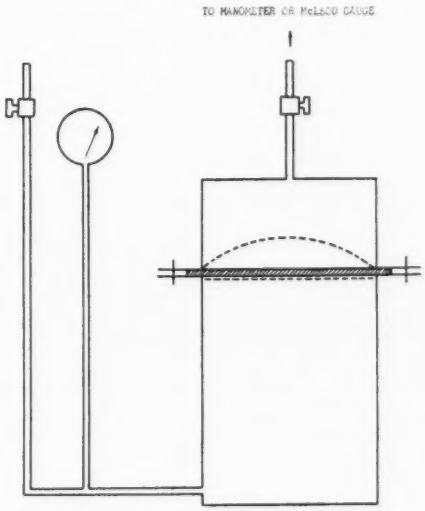


FIG. 1—Permeability cell.

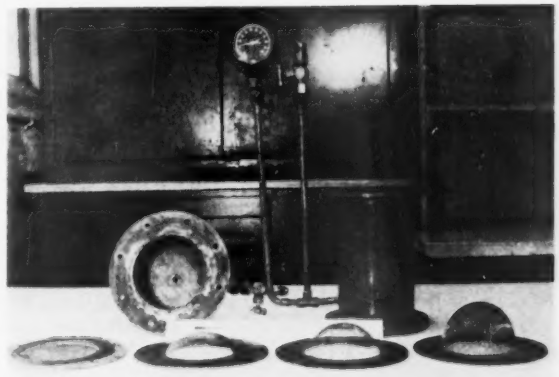


FIG. 2—Open permeability cell with various elongation spheres.

This paper will describe the isotopic technique used to determine the permeability, relative solubility, and rate of evaporation of gases in various elastomers, and will present data obtained by this method.

Apparatus and Experimental Procedure

The apparatus normally used to determine accurately the permeability of rubber samples to gases is similar to that shown in Figure 1 and consists of a metal permeability cell connected to either a mercury manometer or a McLeod gauge. The cell consists of two sections separated by the rubber sample and a brass or nickel gauze spherical sector. By varying the height of this sector any elongation desired can be obtained, as shown in Figure 2. The gas to be used is introduced to the lower part of the cell at a given pressure and the amount of gas that permeates through the rubber is determined by the pressure increase in the upper half as shown on the manometer or McLeod gauge, the pressure of the upper part being either vacuum or at 1 atmosphere before starting. The cell is kept at constant temperature in a constant temperature bath.

When using the radioactive technique developed in this paper, the metal permeability cell in the constant temperature bath is connected to a Geiger counter tube

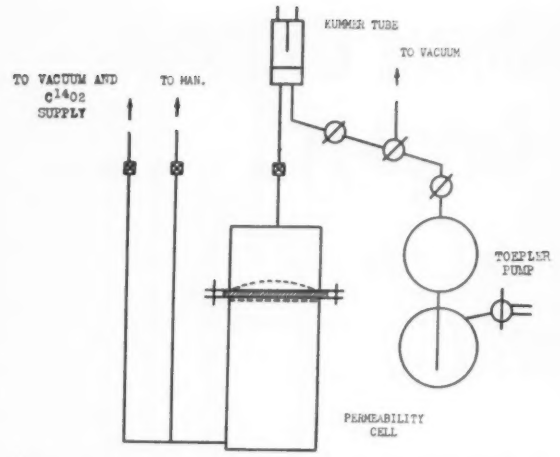


FIG. 3—Permeability set-up for isotopic technique.

used to measure radioactive gases (Kümmer tube) which in turn is connected to a Toepler pump, a vacuum system, and electrically to an El-Tronics scaler as shown in Figures 3 and 4. The Kümmer tube is essentially a thin mica end window Geiger tube with a small cell for the radioactive gases attached to the outer side of the window. The Toepler pump is used to uniformly mix the gas that penetrates the rubber membrane ($\sim$ 0.18 to 0.23 cm. thick). The permeability vessel was made of brass. The lower part of the permeability cell is 67 mm. in diameter and has a volume of 450 ml. while the upper part has a volume of 175 ml.

The permeability vessel above and below the rubber inner tube was evacuated at zero elongation; the lower half was then filled to a given pressure with carbon-14 labeled carbon dioxide leaving the upper half under vacuum. The upper section was then connected to the Kümmer tube and the whole vessel immersed in a constant temperature bath for 7 to 24 hours. During this time the carbon dioxide that permeated into the upper section of the vessel was mixed periodically by means of the Toepler pump and the amount of carbon-14 present was determined by means of the Kümmer tube and El-Tronics scaler. When equilibrium was established

TABLE I—PERMEABILITY OF CO_2 THROUGH RUBBER AT 1 ATMOSPHERE AND 27°C.

(Thickness = 0.20 cm. (0.080"); Area = 34 cm^2)

Sample	Initial Slope* c/m/ m/hr.	Permeability Equilibrium† c/m/m	Permeability Equilibrium† $cm^3/min/cm^2$	Permeability Constant 10^{-6} cm^3/ min/ atm.	% Natural at Equilibrium
Natural	0.98	4.4	6.74×10^{-6}	1.35	100
X-632	1.81	7.2	10.83×10^{-6}	2.17	160
GR-S	0.52	4.8	7.56×10^{-6}	1.50	110
Hycar OR-15	0.087	1.2	2.45×10^{-6}	0.49	33
Neoprene ...	0.004	0.35	0.61×10^{-6}	0.12	8
Butyl	0.001	0.26	0.39×10^{-6}	0.078	6

* Up to 3 hours. † After 15 hours = permeability for rubber slab 0.20 cm. thick.

(rate of increase in carbon dioxide became constant) the run was completed and the radioactively-labeled carbon dioxide was removed from the vessel to the storage bulb.

The amount of radioactivity used per atmospheric run was 0.06 millicuries. The carbon-14-labeled carbon dioxide was prepared by decomposing *in vacuo* 13.5 grams of regular barium carbonate and 0.0045 grams (0.20 millicuries) of carbon-14-labeled barium carbonate (concentration C^{14} = 0.0453 millicuries per milligram) with phosphoric acid. The labeled carbon dioxide was first dried and then frozen into the storage bulb by means of liquid nitrogen.

The vessel was opened after each run and a disk, 2.54 cm. (1 inch) in diameter, was cut from the rubber inner tube tested. The relative solubility of the carbon dioxide in the different rubbers was determined by measuring the amount of radioactivity in the side of the rubber disk exposed to the pressure side of the permeability cell with a thin mica end window Geiger counter tube. The time required to open the vessel and cut the disk was five minutes. It can be seen from the rate of evaporation data (*vide infra*) that less than 1 percent of the dissolved carbon dioxide is lost during the five minutes needed between the end of the run and counting of the radioactivity of the disk. By measuring the loss of the radioactivity in the rubber disk as a function of time the relative rates of evaporation of the carbon dioxide from the various rubbers can be determined.

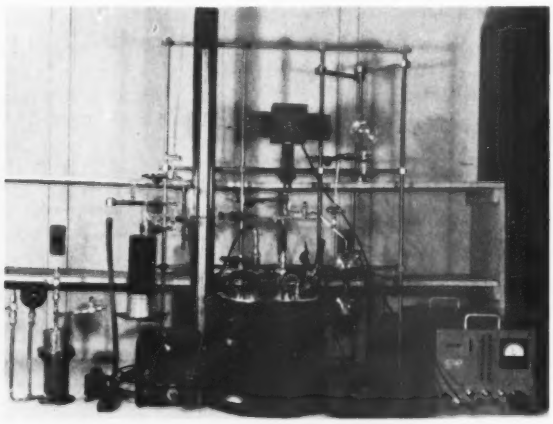


FIG. 4—Permeability set-up with Kümmer tube, scaler, Toepler pump in a constant temperature bath.

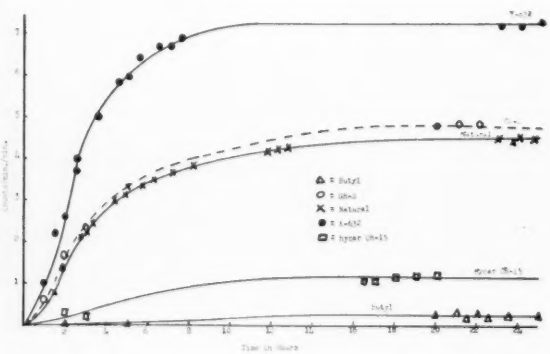


FIG. 5—CO_2 permeability-time curve for various rubbers at 27°C. and 760 mm. (Thickness = 0.080"; Area = 34 cm^2).

TABLE II—EFFECT OF TEMPERATURE ON PERMEABILITY OF CO_2

(Thickness = 0.20 cm.; P = 760 mm.; Area = 34.0 ± 0.2 cm²)

Rubber	27°C.	50°C.	60°C.	75°C.
Permeability in cc. CO_2/min/cm² Rubber 0.20 cm. thick				
Butyl	0.39×10^{-6}	4.00×10^{-6}	—	13.77×10^{-6}
Hycar OR-15	2.45×10^{-6}	3.37×10^{-6}	—	—
Neoprene ...	0.61×10^{-6}	4.37×10^{-6}	—	—
GR-S	7.48×10^{-6}	22.67×10^{-6}	28.39×10^{-6}	33.91×10^{-6}
Natural	6.72×10^{-6}	24.10×10^{-6}	40.24×10^{-6}	63.11×10^{-6}
X-632	10.83×10^{-6}	23.90×10^{-6}	—	38.60×10^{-6}
1/T	0.0033	0.0031	0.0030	0.0029
Permeability Constant in 10^{-6} cm²/min/atm.				
Butyl	0.078	0.80	—	2.75
Neoprene ...	0.12	0.87	—	—
Hycar OR-15	0.49	0.67	—	—
GR-S	1.50	4.53	5.68	6.78
Natural	1.35	4.82	8.05	12.62
X-632	2.17	4.78	—	7.72

Rubber Samples Used

The samples used were 0.18 to 0.23 cm. (0.070 to 0.090-inch) thick compounded and vulcanized slabs. The best curing conditions were used for each type of rubber. The various elastomers used were:

1. Natural rubber.
2. Butyl rubber (98% isobutene, 2% isoprene).
3. GR-S (70% butadiene, 30% styrene).
4. X-632 (a low styrene GR-S type polymer).
5. Hycar OR-15 (61% butadiene, 39% acrylonitrile).
6. Neoprene.

Experimental Results

Permeability: Using the isotopic technique and apparatus described above, the permeability of carbon-14-labeled carbon dioxide through the various rubbers was determined. The samples of rubber used had an area of 34.0 ± 0.2 cm² and were from 0.18 to 0.23 cm. (0.070 to 0.090-inch) thick but the results reported had been corrected for 0.20 cm. (0.080-inch) thick samples. At 27°C. and 1 atmosphere pressure, 15 hours were required in order to determine the permeability value for each elastomer, but the qualitative permeability data were obtained within 3 hours as shown in the permeability-time curves of Figure 5. It can be seen from these curves that Butyl rubber has the lowest permeability while that of the low styrene GR-S type polymer has the highest.

A qualitative comparison of the permeability of the carbon dioxide through the various rubbers can be obtained by comparing the initial slopes (0 to 3 hours) of the permeability-time curves. This comparison together

TABLE III—PERMEABILITY OF CO_2 THROUGH RUBBER RELATIVE TO NATURAL AT 1 ATMOSPHERE PRESSURE

Sample	27°C.	50°C.	60°C.	75°C.
Natural	100	100	100	100
X-632	160	99	—	61
GR-S	110	94	71	54
Hycar OR-15	33	14	—	—
Neoprene	8	18	—	—
Butyl	6	17	—	21

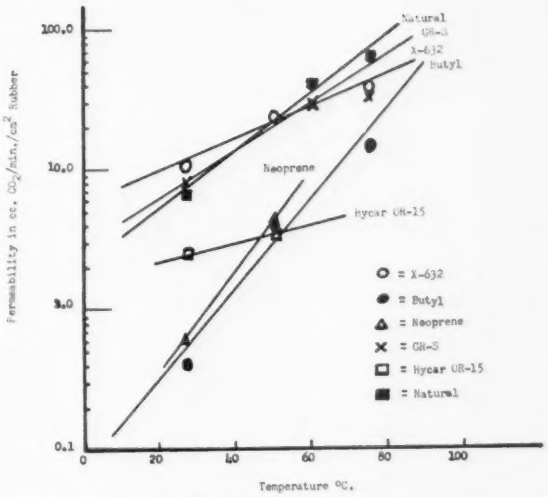


FIG. 6—Effect of temperature on permeability of CO_2. (Thickness = 0.20 cm.; Pressure = 760 mm.).

with a comparison of the actual permeability data for the various rubbers is given in Table I. For practical conveniences the permeability of the various rubbers relative to natural rubber is given in the last column of this table. The next to the last column contains the permeability constant values obtained when our data is applied to the formula used by van Amerongen *(6, 7)*, namely,

$$Q = \frac{dp}{dt} \times \frac{V}{P} \times \frac{d}{A} \times \frac{273}{T}$$

where dp = increase in pressure in upper part of vessel in time dt,
P = gas pressure in lower half of vessel in atmospheres,
V = volume of upper half of vessel,
d = thickness of rubber sheet,
A = area of rubber sheet,
T = average temperature of permeability vessel,
$\frac{dp}{dt} \times V$ = cc. gas per unit time which in our case equals counts/min/min. × cc. CO_2/counts/min.

Therefore, the equation becomes

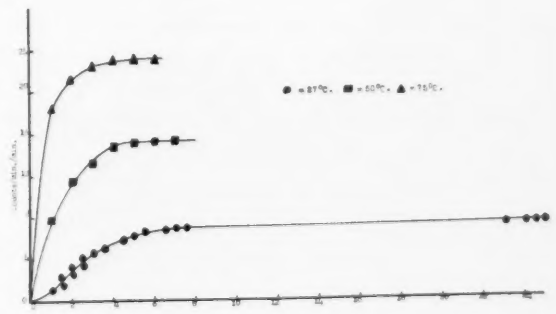


FIG. 7—Effect of temperature on the CO_2 permeability-time curve for X-632.

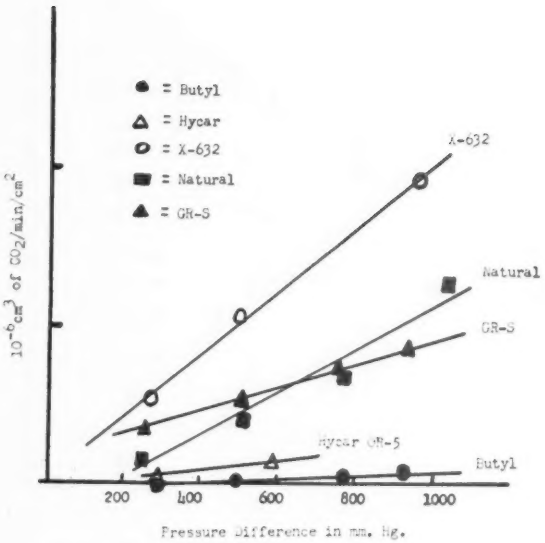


FIG. 8—Effect of pressure on permeability.

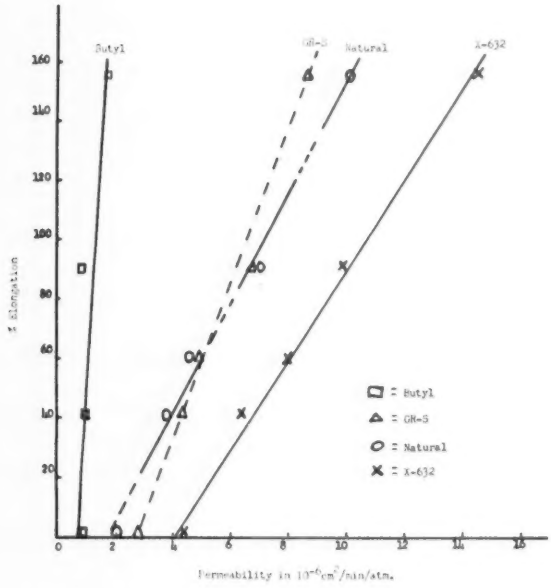


FIG. 9—Elongation versus permeability of air (20 psig 27°C.).

TABLE IV—EFFECT OF PRESSURE DIFFERENCE ON PERMEABILITY OF CO_2 AT 27°C.*

Rubber	Pressure Difference† mm. Hg.	Permeability Constant cc/min/cm²	Permeability Constant 10^{-6} cm²/min.
Butyl	275	0.09×10^{-6}	0.018
	492	0.12×10^{-6}	0.025
	760	0.39×10^{-6}	0.078
	913	0.84×10^{-6}	0.17
Hycar OR-15	273	0.19×10^{-6}	0.037
	576	1.59×10^{-6}	0.32
GR-S	252	3.62×10^{-6}	0.72
	504	5.72×10^{-6}	1.14
	760	7.48×10^{-6}	1.50
	932	8.66×10^{-6}	1.73
X-632	260	5.43×10^{-6}	1.09
	488	10.76×10^{-6}	2.15
	948	18.90×10^{-6}	3.79
Natural	243	2.08×10^{-6}	0.42
	499	4.19×10^{-6}	0.84
	760	6.72×10^{-6}	1.35
	1034	12.81×10^{-6}	2.56

* Permeability for sample 0.20 cm. thick and 34.0 cm² in area. † Since downstream pressure equals zero, the pressure differences in these studies equal the pressures.

$$Q = \text{counts/min/min} \times \text{cc. } CO_2\text{/counts/min.} \times \frac{P(\text{mm})}{760} \times \frac{d(\text{cm})}{A(\text{cm}^2)} \times \frac{273}{T}$$

where Q is expressed in cm²/min/atm. The results seem to indicate that the permeability constant is not affected by pressure difference across the rubber sample, which is to be expected.

Similar permeability-time curves of carbon dioxide were obtained at 50, 60 and 75°C. At these temperatures the permeability values were obtained in five hours instead of the 15 hours required at 27°C. These values

TABLE V—RATE OF INCREASE OF PERMEABILITY OF CO_2 WITH PRESSURE

Rubber	Pressure Coefficient for Sample 0.20 cm Thick 10^{-9} cc/min/cm²/mm Hg.
Butyl	1.18
Hycar OR-15	4.62
GR-S	7.41
Natural	19.6
X-632	13.6

TABLE VI—EFFECT OF ELONGATION OF RUBBER ON PERMEABILITY OF AIR AT 27°C.

Thickness	Butyl 0.137 cm (0.054″)		Natural 0.157 cm (0.062″)		GR-S 0.170 cm (0.067″)		X-632 0.145 cm (0.057″)	
% Elongation	Permeability cc/min/cm²*	Permeability Constant 10^{-6}cm²/min/atm.	Permeability cc/min/cm²*	Permeability Constant 10^{-6}cm²/min/atm.	Permeability cc/min/cm²*	Permeability Constant 10^{-6}cm²/min/atm.	Permeability cc/min/cm²*	Permeability Constant 10^{-6}cm²/min/atm.
0	0.9×10^{-5}	0.91	1.74×10^{-5}	2.0	2.22×10^{-5}	2.8	4.17×10^{-5}	4.4
41	0.9×10^{-5}	0.91	3.26×10^{-5}	3.8	3.47×10^{-5}	4.3	6.04×10^{-5}	6.4
62	—	—	3.96×10^{-5}	4.6	3.89×10^{-5}	4.9	7.50×10^{-5}	8.0
90	0.8×10^{-5}	0.77	6.04×10^{-5}	7.0	5.42×10^{-5}	6.8	9.31×10^{-5}	9.9
155	1.7×10^{-5}	1.7	8.75×10^{-5}	10.1	6.94×10^{-5}	8.7	13.68×10^{-5}	14.6

* For sample of given thickness at 20 psig air.

TABLE VII—RELATIVE SOLUBILITY AND DIFFUSIVITY OF CARBON DIOXIDE IN RUBBER AT 27°C. AND 1 ATMOSPHERE PRESSURE

Sample	Thickness, inches	Counts/min for 2.54 cm. (1") Diameter Sample Bottom	Top	B/T	B/T 0.20 cm. Thickness
Butyl	0.077	98.6	26.6	3.7	3.8
	0.076	101.5	21.5	4.7	4.9
	0.078	94.3	24.5	3.8	3.9
	0.074	96.1	26.5	3.6	3.9
Natural	0.081	54.7	33.6	1.6	1.6
	0.077	48.2	32.5	1.4	1.4
GR-S	0.079	45.8	34.7	1.4	1.4
	0.079	35.7	24.8	1.5	1.5
	0.086	40.6	23.3	1.7	1.6
X-632	0.085	77.6	67.7	1.1	1.0
	0.088	66.5	47.6	1.4	1.3
	0.090	78.3	45.2	1.7	1.5
	0.094	73.9	38.9	1.9	1.6

TABLE VIII—RELATIVE SOLUBILITIES AND DIFFUSIVITIES OF CARBON DIOXIDE AT 27°C. AND 1 ATMOSPHERE PRESSURE

Sample	Thickness, inches	Counts/min for 2.54 cm. Diameter Sample Bottom	Top	B/T	B/T 0.20 cm. Thickness
Butyl	0.076	97.6	24.8	4.0	4.2
Natural	0.079	51.5	33.1	1.55	1.52
GR-S	0.081	40.7	27.6	1.5	1.5
X-632	0.089	74.1	49.8	1.52	1.4

for 27, 50, 60 and 75°C. are tabulated in Table II and compared relative to natural rubber in Table III.

A study of these tables indicates that at 50°C. Hycar OR-15 has a lower permeability value than Butyl while the reverse is true at 27°C. It can also be seen that while X-632 has a much greater permeability to carbon dioxide than either natural or GR-S at 27°C., there is relatively no difference between them at 50°C.; at 75°C., X-632 has a lower value than natural rubber.

The effect of temperature on carbon dioxide permeability is shown in Figure 6. The data show that natural rubber is the poorest rubber for inner tubes, since its permeability at 50 and 75°C. is greater than for any of the other rubbers, while Butyl, Hycar OR-15 and neoprene have the lowest. Natural rubber has the greatest rate of increase in permeability with temperature, while Hycar OR-15 has the lowest. The effect of temperature on the permeability-time curves for X-632 is shown in Figure 7. Similar curves were obtained for the other elastomers in the study.

A study of the effect of pressure on the permeability of carbon dioxide through the various rubbers was made by varying the pressure of the carbon-14-labeled carbon dioxide from 243 to 1034 mm. The results obtained, given in Table IV and Figure 8, show that permeability is proportional to pressure difference which in these cases are equal to the pressures. The rates of increase of permeability with pressure differences for these rubbers are given in Table V. It can be readily seen from this table that pressure has the least effect on permeability when using Butyl and the greatest effect when using X-632. The rate of increase for natural rubber is about two-thirds that of X-632, slightly less than twice that of GR-S, slightly less than three times that of Hycar OR-15, and approximately eight times that of Butyl.

Employing the type of apparatus used by other investigators (see Figures 1 and 2), the effect of elongation from 0 to 155% on permeability of air through Butyl, natural, GR-S and X-632 was studied by varying the size of the brass gauze spherical sectors. The results obtained showed that elongation has a linear effect on the permeability for all four types of rubber tested. These results are shown in Table VI and Figure 9. It can be seen that elongation has the least effect on the permeability of air through Butyl rubber.

Solubility: In order to determine the relative solubility or absorption of carbon dioxide in the various rubbers, a disk 2.54 cm. (1 inch) in diameter was cut from each slab when permeability equilibrium had been reached and the bottom side (side exposed to the lower half of the vessel containing the carbon-14-labeled carbon dioxide) was measured for radioactivity with a thin mica end window Geiger counter. The time elapsed between equilibrium and counting was 5 minutes. The amount of carbon dioxide lost during these 5 minutes was less than 1% as shown by the rate of evaporation data *(vide infra)*. A comparison of the radioactivity of each rubber is a comparison of their solubilities.

At least two runs were made for each of the following rubbers: Butyl, natural, GR-S and X-632. The results obtained are shown in Table VII and summarized in Table VIII. It can be seen from these tables that carbon dioxide is more soluble in Butyl than in the other three rubbers. A comparison of the carbon dioxide solubility in the various rubbers relative to natural is shown in Table IX and compared with those found by van Amerongen *(6, 7)*. The results obtained by the isotopic method show that carbon dioxide is about twice as soluble in Butyl rubber as in natural while van Amerongen found it only to be three-fourths as soluble.

The diffusion of gases is extraordinarily slow in Butyl, thus making it difficult to obtain uniform carbon dioxide concentration throughout the Butyl rubber. This might account for some of the difference between the van Amerongen data and the data obtained by the isotopic method. The isotopic method does not encounter this difficulty since the carbon-14 on the surface only is measured. A second reason for the difference could be that different formulations were used by van Amerongen and the authors in compounding.

Evaporation: The rate of evaporation of carbon dioxide from the various rubbers can be determined by measuring the loss of radioactivity in the 2.54 cm. diameter disks with time. These results are shown in Table X and Figure 10. It can be observed from this table and figure that the rates of evaporation of carbon dioxide are approximately the same for X-632, GR-S and natural rubber, while the evaporation rate is much slower for Butyl.

TABLE IX—SOLUBILITY OF CARBON DIOXIDE IN VARIOUS RUBBERS RELATIVE TO NATURAL

	27° C.	Van Amerongen 25° C.
Natural	100	100
GR-S	79	95
Butyl	190	76
X-632	144	——

TABLE X—EVAPORATION OF ABSORBED CARBON DIOXIDE

Time, Days	% of Initial Counts/Min/2.54 cm. Diam. Disk			
	Butyl	GR-S	X-632	Natural
0	100	100	100	100
1	59.9	—	45.0	37.5
2	—	31.0	28.6	22.1
3	49.6	24.4	—	—
4	44.7	—	—	—
5	39.7	—	—	—
6	—	—	—	—
7	32.5	—	—	—

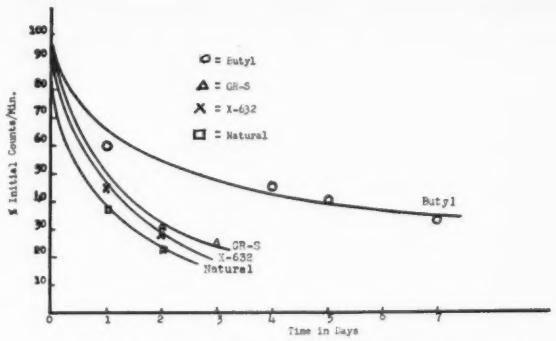


FIG. 10—Evaporation of absorbed carbon dioxide.

Discussion of Results

In the permeability studies reported using 0.20 cm. thick samples, 15 hours (900 minutes) were required for equilibrium to be reached at 27°C. If samples as thin as those used by Brubaker and Kammermeyer (0.002 cm.) *(8)* were used, the time required to reach equilibrium conditions would only have been about 9 minutes since equilibration time is proportional to the thickness of the sample. The technique and apparatus reported by Brubaker and Kammermeyer were used for samples having a permeability constant range of 0.074 $\times 10^{-9}$ to 140 $\times 10^{-9}$, i.e., a range of 1 to 2000. The range used with the isotopic method as reported in this paper was 1 to 30. This, however, is not the limiting range.

The sample tested having the lowest permeability constant was Butyl rubber which recorded 400 counts per minute at equilibrium. The Geiger counter used in these studies could measure 4 counts per minute very accurately. Therefore, a sample having a permeability constant of 1/100 of Butyl could be measured readily, increasing the range to 1 to 3000. In these studies only 0.06 millicuries of carbon-14 were used. If 1 millicurie was used, the counts per minute would have been increased 17 fold. A sample 17 times less permeable could then be measured, increasing the range to 1 to 51,000. This range could be greatly increased still further by using other Geiger counter tubes, i.e., screen wall counters which do not absorb any radioactivity. These counter tubes would have more counts per minute for 1 millicurie of radioactivity. An increase of the area of the sample used, which is the only way to increase the range of the Brubaker and Kammermeyer method, would also increase the range of the isotopic method still further.

Summary

Using the isotopic method one can determine the permeability of gases which have isotopes with long half lives through elastomers accurately in short lengths of time over a very long permeability range.

The relative solubilities and rates of evaporation can be obtained simultaneously with the permeability data.

ACKNOWLEDGMENT

The authors wish to thank the Lee Rubber and Tire Corporation, Conshohocken, Pa., for their financial support and Dr. A. V. Grosse for his fruitful advice.

LITERATURE REFERENCES

(1) Barrer, R. M., *Trans. Faraday Soc.*, **35,** 628 (1939).
(2) Carpenter, A. S., and Twiss, D. F., *Ind. Eng. Chem. (Anal. Ed.)*, **12,** 99 (1940).
(3) Corwin, A. H., and Karr, C., Jr., *Anal. Chem.*, **20,** 1116 (1948).
(4) Daynes, H. A., *Trans. Inst. Rubber Ind.*, **3,** 428 (1927).
(5) Riehl, N., *Kolloid Z.*, **106,** 201 (1944).
(6) van Amerongen, G. J., *J. Applied Phys.*, **17,** 972 (1946); *Rubber Chem. Tech.*, **20,** 495 (1947).
(7) van Amerongen, G. J., *J. Polymer Sci.*, **5,** 307 (1950).
(8) Brubaker, D. W., and Kammermeyer, K., *Ind. Eng. Chem.*, **45,** 1148 (1953); *Anal. Chem.*, **25,** 424 (1953).

Report on Accidents Involving Carbon Tetrachloride

SAFETY supervisors are frequently concerned with the health problems connected with the use of carbon tetrachloride for cleaning purposes. The following two reports are taken from a recent issue of the *Safety Notes Letter* issued by the Rubber Section of the National Safety Council:

Case No. 1: Three employees were dipping reels in a 25-gallon drum containing 12 to 14 gallons of tetrachloride. After about an hour of work, they had lunch and then worked for about 3½ hours in the afternoon. The actual spool cleaning job, however, lasted about 3 hours. One of the employees became nauseated during the first hour and was again sick later in the day. Fortunately, the area in which they were working was fairly well ventilated and this undoubtedly prevented a serious exposure.

Case No. 2. A carboy containing a mixture of 3% bromine in carbon tetrachloride collapsed in a "tennis" vulcanizing area. The fumes spread over adjoining areas where operators were working. Fire doors were closed to restrict this spread as much as possible. Whiting was used to dam up and absorb the bromine. This was shoveled into containers and removed as soon as possible. The remainder was flushed down a drain with a fire hose. Those handling the emergency wore all-service gas masks. Bromine-carbon tetrachloride solution is no longer handled in these large carboys but is transferred to one quart and one gallon bottles which are transported and handled in wooden containers. These containers are kept outdoors and brought inside only as needed.

Division of Rubber Chemistry, A.C.S., Meets in Louisville on April 14-16, 1954

THE 65th Meeting of the Division of Rubber Chemistry of the American Chemical Society will be held at the Brown Hotel in Louisville, Kentucky, on Wednesday, Thursday and Friday, April 14, 15 and 16. The meeting, which is being held apart from the parent society, will feature the presentation of 18 technical papers, and will include a luncheon-meeting of the 25-Year Club, a business session, plant visitations, a special program for the ladies, and the usual divisional banquet.

The technical program has been divided into three sessions, namely, Wednesday afternoon, Thursday morning and Friday morning. J. C. Walton (Boston Woven Hose), divisional chairman, will preside over the first session, John M. Ball (Midwest Rubber Reclaiming), divisional vice-chairman, over the second, and F. C. Wagner (DuPont), who is chairman of the Local Arrangements Committee, over the third. The business session will be held during the technical program on Thursday morning. As usual, social activities will be started with the luncheon-meeting of the 25-Year Club, with Al Brandt (Goodrich Chemical) presiding as chairman.

Thursday afternoon has been left open for plant trips in the Louisville area. Two trips are scheduled for the city's "Rubbertown" area, one to the DuPont plant which produces neoprene and the other to the government-owned copolymer plant operated by the Kentucky Synthetic Rubber Co. Trips are also being provided to the plants of the Brown-Forman Distillers Corp. and the General Electric Co. The latter plant produces major electrical appliances, including washing machines, electric sinks and ranges, refrigerators, etc. Because of limited facilities, preferences for plant visits should be expressed as soon as possible.

The divisional banquet will be held at the Brown Hotel on Thursday evening, April 15. The principal speaker will be Clarence E. Manion, former dean of the Notre Dame College of Law and ex-chairman of the Committee on Inter-Governmental Relations. Widely known as an educator, lawyer and author, Mr. Manion will speak on governmental encroachment on civil rights and personal liberties. Dinner music will be furnished by one of the South's leading organists, and other light entertainment plus a few little surprises are in store.

A full and attractive program for the ladies has been arranged. On Wednesday, a trip is scheduled to the Brown-Forman plant followed by a visit to the famous Churchill Downs which will be sprucing up for the Kentucky Derby. On Thursday, there will be a choice of all-day trips to nearby Bardstown or to local points of interest, the former including lunch at Talbot Inn, one of the earliest inns in Kentucky. An opportunity to participate in "Coffee Call," a local radio program, will also be provided, as well as tours of the local radio and television stations and a visit to the plant of the Louisville *Courier-Journal*.

Assisting Dr. Wagner on the Local Arrangements Committee are the following: *Finance*, N. R. Legge (Kentucky Synthetic Rubber); *Plant Trips*, J. C. Weyrich (DuPont); *Banquet*, H. C. Homan (DuPont); *Ladies Entertainment*, M. R. Broadbrooks (DuPont); *Program*, J. R. Goertz (DuPont); *Registration*, T. R. Linak (Goodrich Chemical); *Housing*, R. M. Reed (Girdler); *Publicity*, N. C. Updegraff (Girdler). W. M. Glenn (DuPont) is acting as secretary to the committee.

Abstracts of the 18 papers scheduled for presentation, together with their authors and their company connections, follow:

Program of the
DIVISION OF RUBBER CHEMISTRY
AMERICAN CHEMICAL SOCIETY
Brown Hotel, Louisville, Kentucky
April 14-16, 1954

Wednesday Morning—April 14

9:00 A.M.—Registration.
12:00 Noon—25-Year Club Luncheon.

Wednesday Afternoon—April 14

2:00 P.M.—Introductory Remarks by J. C. Walton (Boston Woven Hose), Division Chairman.
2:15 P.M.—Technical Papers.

Thursday Morning—April 15

9:00 A.M.—Technical Papers.
11:35 A.M.—Business Meeting.

Thursday Afternoon—April 15

2:00 P.M.—Plant Visitations.

Thursday Evening—April 15

7:00 P.M.—Divisional Banquet, Brown Hotel.

Friday Morning—April 16

9:00 A.M.—Technical Papers.

ABSTRACTS OF PAPERS

Wednesday Afternoon—April 14

J. C. Walton, Presiding

2:00 P.M.—1—Introductory Remarks, *J. C. Walton.*

2:15 P.M.—2—N-Substituted Alkylsulfenyl Dithiocarbamates as Accelerators of Rubber Vulcanization. *J. V. Svetlik, H. E. Railsback, and C. C. Biard (Phillips Petroleum Co., Bartlesville, Okla.). (Paper will be presented by J. V. Svetlik).*

Alkylsulfenyl dithiocarbamates derived from secondary amines are a new class of powerful vulcanization accelerators. The structure and molecular weight of these compounds influence their activity and effect on physical properties of rubber vulcanizates.

Exceptionally good scorch resistance and powerful accelerating action are conferred by some of the N,N-disubstituted-alklysulfenyl dithiocarbamates. These are two extremely desirable characteristics of the present-day accelerator in view of the current trend toward (1) faster mixing and processing with resultant higher operating temperatures and (2) shorter curing cycles.

Comprehensive compounding data are presented using *tert*-butylsulfenyl dimethyl dithiocarbamate as vulcanization accelerator in synthetic and natural rubbers. Lower accelerator requirements and improved scorch resistance characterize this material as compared to commercial products. Tests in GR-S-1500 show stocks accelerated with *tert*-butylsulfenyl dimethyl dithiocarbamate possess greatly improved aging resistance over control stocks.

2:45 P.M.—3—Accelerated Weathering of Various Elastomers Using a Heliostat. *G. H. Cosner and Ray Thoman (Gates Rubber Co., Denver, Colo.). (Paper will be presented by Ray Thoman).*

Attempts to correlate results from accelerated weathering units with those from outdoor exposure over a range of compounds of different elastomers have been unsuccessful. This lack of success is largely due to the fact that there is no single set of values, for such variables as temperature, spectral distribution, ozone concentration, humidity and light intensity, that can be considered representative of all test stations at all times of the year. Only by a thorough understanding of each of these variables can accelerated, outdoor-exposure, and service tests be interrelated.

A heliostat, or sun-follower, was constructed which permitted specimens to continuously face the sun. This greatly increased the incident radiant energy without altering the other variables. Simultaneous exposures were made of a number of different compounds containing natural rubber, GR-S, GR-A, neoprene, GR-I and polyvinyl chloride, strained and unstrained, on the heliostat and on stationary racks facing different directions. Although no direct correlation existed between the compounds as a group over the various exposure conditions, definite trends did appear between the rate and type of aging and the orientation with respect to the sun's path for each of the compounds.

By placing filters over "gum stocks" of the above elastomers on the heliostat, the effects of various portions of the sun's spectrum were noted. All of the elastomers aged more rapidly the shorter the wave length of light, except GR-S, which appeared to be most rapidly degraded by visible radiation.

The results obtained in this study show that the heliostat offers great possibility as a tool for accelerated light aging. They also indicate that outdoor exposure tests should be considered in the same light as artificially accelerated tests and should be conducted under conditions as nearly equal to the expected service conditions of the product as possible.

3:10 P.M.—4—Effect of Sulfur and Accelerator Variation upon the Rate of Oxidation and the Deterioration of Properties of Rubber Vulcanizates. *William L. Cox and J. Reid Shelton (Case Institute of Technology, Cleveland, Ohio). (Paper will be presented by J. Reid Shelton).*

The variable effect of cure upon aging of rubber stocks suggested a need for further study of the effect of different types and amounts of accelerator, and different sulfur concentrations, upon the rate of oxidation of vulcanizates and the resultant deterioration of properties.

The rate of oxygen absorption increases with increased sulfur concentration in both natural rubber and GR-S black stocks. Changes in tensile strength, modulus, and ultimate elongation, resulting from the absorption of a given amount of oxygen, are only slightly affected by changes in sulfur and accelerator concentrations. Consequently, low-sulfur stocks exhibit better aging resistance.

A change in the nature of the accelerator may affect both the rate of oxidation, and the change in properties brought about by a given absorption of oxygen. For example, Santocure-accelerated stocks oxidize at a lower rate than Tuads-accelerated stocks, and also exhibit a lower rate of change in tensile strength for a given amount of oxygen absorbed.

An increase in either sulfur or accelerator concentration affects the properties of the vulcanizate and the early stages of aging so as to give a stiffer stock with lower elongation, both initially and after the absorption of any given amount of oxygen. This is particularly evident with GR-S, and is a major factor in the aging of GR-S vulcanizates.

3:40 P.M.—5—The Evaluation of Commercial GR-S Polymers by Means of the Creep Test. *J. G. Lichty, R. B. Spacht, and W. S. Hollingshead (Goodyear Tire & Rubber Co., Akron, Ohio). (Paper will be presented by J. G. Lichty).*

Statistical data on the stability of ten GR-S polymers have been obtained by means of the creep test. Eight different lots of each polymer containing the commonly used non-discoloring and discoloring antioxidants were studied. Oil-extended polymers were omitted from this study. The same antioxidants were rated in extracted pale crepe by oxygen bomb aging and by the creep test. All data were obtained on cured gum stocks.

Ratings of the antioxidants by the creep test method were essentially the same regardless of the type of rubber used. Furthermore, this rating was the same as that obtained by the oxygen bomb aging of extracted pale crepe stocks. Differences between the stability of hot and cold polymers can be demonstrated. Variability in stability between various lots of the same polymer is shown and comparisons are made of this variability between different polymers.

Results show that the creep test is very well adapted to demonstrate differences in stability between GR-S polymers.

4:05 P.M.—6—Laboratory Methods of Dynamic Testing of Compounds Containing Reclaimed Rubber. *J. M. Ball and R. L. Randall (Midwest Rubber Reclaiming Co., East St. Louis, Ill.). (Paper will be presented by J. M. Ball).*

The dynamic properties of compounds containing mixtures of reclaimed and natural rubber, and mixtures of reclaim and GR-S, are described. The compounds are test recipes only, designed to have approximately equal hardness, specific gravity and RHC by volume. Five test methods were used: (1) Dunlop pendulum, (2) Torsional hysteresis, (3) Absolute hysteresis, (4) St. Joe flexometer, and (5) Inclined plane hysteresis.

The results are presented with the following comparisons in mind: (1) Between natural rubber and GR-S, (2) Between the reclaim compounds and the new rubber controls, (3) Between different proportions of reclaim, and (4) Between the various test methods. The results also contain information on the rate of cure of the various compounds.

The natural rubber control compound has lower hysteresis than the GR-S control by all five methods, and this same relationship between natural rubber and GR-S tends to hold also for the reclaim compounds. There are important exceptions, however. The Dunlop pendulum and the torsional hysteresis tests agree completely for all compounds. The inclined plane hysteresis shows no significant difference between natural rubber and GR-S in the reclaim compounds. Three of the five methods show that the natural rubber compound containing reclaim in 25 percent substitution is comparable in dynamic properties with the straight GR-S control compound.

4:30 P.M.—7—Changes in Branching and Distribution Effected by Milling Hot GR-S. *W. K. Taft and June Duke (Government Laboratories, University of Akron, Akron, Ohio). (Paper will be presented by June Duke).*

Mooney, concentrated and dilute solution viscosity data obtained from milled samples of a GR-S made at 122°F. were examined by principles from which the changes in concentrated solution viscosity can be correlated with branching and in the other two viscosities with molecular weight distribution. It is indicated that the distribution is not altered significantly by milling the polymer at 90° and 180°F., but that the degree of branching is increased with time of milling up to 40 minutes. Beyond that time, branching becomes less. Milling at 250°F. apparently causes the short chains to be broken off, thus affecting the molecular weight distribution markedly, but with continued milling at this temperature, the short chains recombine rapidly with longer chain molecules to form branched chains. (NOTE: The work reported herein was carried out under the sponsorship of the Synthetic Rubber Division, Reconstruction Finance Corporation, in connection with the government synthetic rubber program).

Thursday Morning—April 15

John M. Ball, Presiding

9:00 A.M.—8—Particle Size in High Solids Synthetic Latex. ***Maurice Morton and W. E. Gibbs (Rubber Research Laboratories, University of Akron, Akron, Ohio). (Paper will be presented by Maurice Morton).***

A study has been carried out on the relation between particle size, rate of polymerization and viscosity of polybutadiene latex polymerized to high solids content (ca. 50%). The latices were prepared by means of seeded emulsion polymerization at 5° and 30°C., using seed latices with particle diameters ranging from 400 to 1600 Å.

As expected, the rate of polymerization decreases sharply with increasing particle size, due to the marked decrease in the number of particles. The viscosity of the final latex, however, does not vary greatly with the particle size. The main difficulties occur during the polymerization itself, when the particles are swollen with monomer and hence cause a large increase in latex viscosity.

It appears advantageous, therefore, in the preparation of such high solids latex, to work with smaller particle sizes, since the gain in rate more than offsets any small increase in viscosity. A calculation of the dependence of volume fraction on particle diameter substantiates this conclusion, the volume fraction remaining relatively constant for a given inter-particle distance. However, the large surface area of the smaller particle size latex may require more stabilization precautions.

9:25 A.M.—9—Oil Types in the Oil-Extended Rubber Program. ***W. K. Taft, M. Feldon, J. Duke, R. W. Laundrie, and D. Prem (Government Laboratories, University of Akron, Akron, Ohio). (Paper will be presented by W. K. Taft).***

In the interest of standardization and reduction of numbers of oil-extended polymers, oils have been classified by types on the basis of their percentage composition defined as certain fractions. This paper reports a critical examination of the feasibility of this characterization.

In the first part of the paper dealing with the individual fractions the results indicated that: (1) Nitrogen bases caused the most rapid initial breakdown and the paraffin fraction the least, (2) The nitrogen bases (Group I) accelerated cure and gave vulcanizates whose modulus remained unaffected by extended curing, (3) The paraffins gave faster cure than the acidaffins, and (4) The compatibility of the oil increased with its unsaturation.

Examination of eighteen commercial oils arranged in four groups indicated that the individual fractions are essentially additive. The total nitrogen bases plus the chemically active first acidaffins accentuate heat and Banbury breakdown of the polymer. Paraffins retard the breakdown. Narrow limits of the viscosity of the oils, total nitrogen bases and paraffins are shown to be necessary in specifications. Undesirable breakdown of the polymer can be minimized by aeration of the latex prior to masterbatching with no sacrifice in physical properties or processing. General substantiation of either the Office of Synthetic Rubber or Rostler method of classification has been obtained.

(NOTE: The work reported herein was carried out under the sponsorship of the Synthetic Rubber Division, Reconstruction Finance Corporation, in connection with the government synthetic rubber program).

9:50 A.M.—10—Factors Influencing the Utility of Neoprene Cements. ***L. S. Bake (Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.).***

The neoprenes as a class are probably the most useful of the synthetic rubbers for the manufacture of adhesive cements. The utility of an adhesive cement is dependent upon properties such as stability, cohesive strength, adhesion to various surfaces, length of tack retention, fabric deterioration and resistance to elevated temperatures. This paper deals with the effect upon those properties of such variables as different types of neoprene, blends of the various types and the effect of compounding ingredients. The greatest amount of study has been made with the various synthetic resins, but some attention is also given to those compounding ingredients normally used with dry neoprene stocks.

10:15 A.M.—11—Vulcanization of the W Type of Neoprene with Combinations of a Thiuram, a Guanidine and Sulfur. ***R. M. Murray and D. C. Thompson (Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del). (Paper will be presented by R. M. Murray).***

The W types of neoprene generally require the use of organic accelerators in addition to metallic oxides to effect high rates and states of cure. Certain commonly used rubber accelerators have proved effective, particularly when sulfur is present. This paper reports the effect of combinations of a thiuram and a guanidine on the vulcanization of the W types of neoprene in the presence of sulfur and metallic oxides. The compositions studied had a higher degree of processing safety relative to their cure rates than any previously reported. A two to three-fold increase in Mooney scorch time without reduction in cure rate is realized through the use of these combinations. Results are similar for Neoprene Type W, WHV and WRT compositions. Different types of thiurams and guanidines have been evaluated at various concentrations. The effects of curing temperature, sulfur concentration, amount and type of metallic oxide and loading are shown. Data show Mooney scorch values, stability of uncured stocks, cure rate and important vulcanizate properties.

10:40 A.M.—12—The Effect of Masterbatching, Compounding and Testing Variables on Constant Slip Abrasion Results. ***L. H. Howland, W. W. White, and W. E. Messer (Naugatuck Chemical Division, U. S. Rubber Co., Naugatuck, Conn.). (Paper will be presented by W. W. White).***

It has been reported that a modified Lambourn abrasion test gives results on tire treads which correlate rather well with roadwear data. However, in evaluating tire tread stocks from carbon black-GR-S masterbatches made in various ways, the results have indicated that some machine improvements would be desirable, and that more knowledge of the influence of testing, compounding, and masterbatching variables was required. As a result of this, numerous studies have been made which have resulted in considerable knowledge on the problem. Results have been obtained on the effect on abrasion of such compounding and testing variables as modulus, combined sulfur, the percent slip, the coefficient of friction of the test wheel, the amount of dusting and type of dust, and ambient temperature.

Test results obtained at various temperatures appear to be of interest in offering a laboratory abrasion test to correlate with roadwear tests performed at different seasons of the year. For testing the temperature variable, an abrasion machine has been built which has a constant temperature cabinet surrounding the test wheel and the Emery wheel. The improved equipment and techniques resulting from these studies have resulted in the development of masterbatches from oils, carbon black, and high Mooney viscosity cold GR-S that appear to be improvements over previous masterbatches from these respective components.

11:05 A.M.—13—The Influence of Surface Roughness and Porosity on the Performance of Carbon Blacks. ***E. M. Dannenberg and B. B. S. T. Boonstra (Godfrey L. Cabot, Inc., Boston, Mass.). (Paper will be presented by B. B. S. T. Boonstra).***

The surface "roughness" and porosity of carbon blacks can be estimated by the difference in surface area values determined from electron microscope measurements of particle size distribution and the Brunaur, Emmett, and Teller method of low temperature nitrogen adsorption. Calculations of surface area from electron miscroscope particle size distribution curves give an estimate of the external particle surfaces, whereas the gaseous adsorption method gives a value for the total specific surface which includes both the exterior surface area and the internal surface area due to porosity.

It is shown that the development of internal surface can occur without changing particle size characteristics. Examples of this phenomenon are the so-called "after-treated" or oxidized channel blacks which are used in the ink and lacquer industries. Oil furnace blacks in any particular particle size category can be prepared having a wide range of gaseous adsorption measured surface areas. An estimate of about 15Å for the actual pore diam-

eters has been made from considerations of the carbon black crystallite size, adsorption and desorption isotherms, and the relationship of loss in weight during oxidation to the surface area increase.

Although commercial grades of oil furnace blacks are essentially non-porous, it is shown that the effects of surface area even over a normal range can be detected in rubber testing providing the rubber recipe used is critical with respect to its curing behavior. In most recipes the small range of surface areas characteristic of various sources of commercial products does not have a significant effect. Using samples of pilot plant furnace blacks covering a wide range in surface area at constant particle size, an investigation was made of rubber performance. The rubber properties which showed consistent trends with increasing internal surface area were: (1) rate and state of cure, (2) rebound resilience, and (3) electrical conductivity. High internal surface area resulted in cure retardation, lower rebound resilience, and high electrical conductivity. This latter correlation of area and electrical conductivity has led to the recent commercial introduction of highly conductive oil furnace blacks. It is postulated that cure retardation is due to the physical adsorption of accelerator or other curative ingredients on the black surfaces, and that the lowering of resilience and increase in conductivity are the result of increased carbon chain and network formation in the vulcanizates.

In order to study the effects of surface area without the complications inherent in the use of different pilot plant samples, another group of blacks was prepared from a base raw material in the laboratory by air oxidation covering the surface area range up to 500 m^2/g. Although cure retardation in rubber was again apparent with these blacks, no effect on rebound or electrical conductivity was noted. Also observed was a significant improvement in reinforcement with increasing surface area at constant particle size, indicating the possibility that the interaction between the rubber molecules and the carbon particle surfaces has been enhanced.

11:35 A.M.—Business Meeting.

Friday Morning—April 16

F. C. Wagner, Presiding

9:00 A.M.—14—Continuous Hot Air Vulcanization and Room Temperature Vulcanization of Silicone Rubber. ***D. C. Youngs and G. M. Konkle (Dow Corning Corp., Midland, Mich.). (Paper will be presented by D. C. Youngs).***

Many fabricators have been looking forward to the day when rubber tubing and intricately shaped extrusions can be vulcanized continuously. Steam-heated continuous vulcanizers have been very successfully used in making organic rubber and silicone rubber insulated wire, but it is impossible to cure extruded rubber tubing in a continuous vulcanizer because of the problem of seals at the end of the steam tube.

With a continuous hot air vulcanizer, the most complicated silicone rubber extrusions can be easily made continuously. This process is designed primarily for vulcanizing intricate extrusions that are difficult or impossible to produce commercially on conventional equipment because of sticking, collapsing or distortion. This technique is adaptable to standard extrusion machines. It is an inexpensive and efficient way to produce continuously many types of extrusions. Pictures of the equipment will be shown. Typical properties of silicone rubber extrusions that have been vulcanized in hot air equipment will also be presented.

There have been many requests for a silicone rubber than can be used where heat cannot be applied to vulcanize the rubber. Silastic (RTV) stocks that will vulcanize when allowed to stand at room temperature are now available. These materials are very useful for insulating electrical equipment and as caulking compounds, bonding materials and fabric coating. Fabricating techniques, bonding strength to various materials and typical properties of the cured material will be discussed.

9:30 A.M.—15—Compounding of Silicone Rubber. III. ***F. L. Kilbourne, Jr., Clinton M. Doede, and Keistutis J. Stasiunas (Connecticut Hard Rubber Co., New Haven, Conn.). (Paper will be presented by F. L. Kilbourne, Jr.).***

Earlier work with hydrophobic silica (DuPont Fine Silica) has been extended. It has been found that superior tensile strengths are found if rubbers with molecular weights of approximately 400,000, or higher, are used.

The hydrophobic silica exerts a continuous curing action, unlike peroxides. It has been found possible and practical to retard the vulcanization rate and the overcuring tendency by the introduction of certain antioxidants. Among those upon which report is made are diphenylamine, hydroquinone monobenzyl ether, 2,6 ditertiary butyl 4 methyl phenol, paraisopropoxydiphenylamine, and the ditertiary alkyl hydroquinones. Hexachloronaphthalene also has a significant retarding action on the curing and aging.

This work defines more closely those conditions necessary to achieve high strength and will make it possible for silicone rubber to be used in wider fields of application.

9:55 A.M.—16—Aging Stability of Neoprene Latex. II. The Relation Between Crosslinking and the Hydrolysis of Allylic Chlorine. ***D. E. Andersen and P. Kovacic (Jackson Laboratory, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.). (Paper will be presented by D. E. Andersen).***

The tensile strength of neoprene films prepared from latex declines as the latex ages. This work describes the changes in the chemical structure of neoprene latex particles with age. These changes are related both to the tensile strength decline and to the mechanism of vulcanization. Of the several methods for augmenting the tensile strength, this paper discusses the use of compounding materials which apparently do not act by the formation of crosslinks.

It is shown that neoprene crosslinks through active chlorine positions on the polymer chains while aging as a latex as well as during cure. Semi-quantitative relationships are established between the number of active positions, the number of crosslinks, the latex age, the time of cure, and the tensile strength.

10:25 A.M.—17—Improved Crosslinked Synthetic Rubbers. ***R. D. Gilbert, A. H. Krause, and N. R. Legge (Research and Development Department, Kentucky Synthetic Rubber Corp., Louisville, Ky.). (Paper will be presented by N. R. Legge).***

Synthetic rubbers crosslinked with divinylbenzene are widely used in the footwear and mechanical goods industries to provide lower mill shrinkage, greater smoothness and better retention of dimensions in extruded and calendered sheets than regular GR-S. Unfortunately, the crosslinking also results in decreased tensile strength and elongation in comparison with regular GR-S. The development of an improved crosslinked polymer is described.

The tensile and elongation properties of crosslinked copolymers of butadiene and styrene have been improved very significantly by providing a more homogeneous crosslinked network. This has been attained by the incremental addition of divinylbenzene and of regulator (tertiary dodecyl mercaptan). Other changes in the polymerization conditions and polymer composition have also been beneficial. Among these are the use of 41°F. polymerization temperature and an increase in the bound styrene content to 30 percent. The improved polymers have mill shrinkage values in the range of 20 to 30 percent. When compounded in a 40 phr EPC black recipe, the new polymers gave compounded Mooneys in the range of 120 to 135. ML-4′, optimal tensile values in the range of 2900 to 3100 psi, with elongations of 350 to 400 percent. Physical test data from laboratory and factory evaluations are described.

The theoretical considerations of this system are discussed.

10:50 A.M.—18—Control of Molecular Weight of Butadiene-Styrene Copolymers. I. C_8-C_{16} Mercaptans as Regulators. ***T. W. Boyer and N. R. Legge (Research and Development Department, Kentucky Synthetic Rubber Corp., Louisville, Ky.). (Paper will be presented by T. W. Boyer).***

In standard GR-S type emulsion polymerization the chain regulator, generally C_{12} mercaptan, is added in the initial charge of reactants. This results in the formation of low molecular weight polymer during the initial stages of the reaction. The

low molecular weight polymer, since it does not contribute greatly to tensile strength, depreciates the quality of the polymer. As the GR-S reaction proceeds, the concentration of regulator decreases and the average molecular weight increases rapidly. Control of molecular weight becomes more difficult in this latter stage.

The incremental addition of regulator has been examined as an approach to the goal of control of average molecular weight of the polymer throughout the polymerization reaction. It is postulated that this should provide more uniform polymer of better quality. Intrinsic viscosity-conversion data for 41°F. reactions with incremental addition of C_{12} or higher tertiary mercaptans showed two intervals of decreasing molecular weight as the conversion increased. This was unexpected since the rate of addition of regulator was uniform. It was assumed that these phenomena were owing to the slow rate of diffusion of these mercaptans and an effective increase in mercaptan concentration at the locus of reaction when the micelles and oil phase disappeared.

Lower (than C_{12}) mercaptans with higher rates of diffusion and more water solubility were expected to reduce these fluctuations in molecular weight. However, a study of incremental addition of tertiary-C_8, C_6 and C_4 mercaptans still showed similar fluctuations. Therefore, it is postulated that the reduction of polymer molecular weight during these intervals is associated with an increased amount of mutual termination.

Physical properties of polymers prepared with incremental addition of these modifiers are compared with those of standard polymers.

11:15 A.M.—19—High Molecular Weight Butadiene-Styrene Copolymers for Oil Extension. ***T. W. Boyer, R. D. Gilbert, and N. R. Legge (Research and Development Department, Kentucky Synthetic Rubber Corp., Louisville, Ky.). (Paper will be presented by R. D. Gilbert).***

The development of very high molecular weight polymers capable of extension with high oil loadings—up to 90 parts of oil to produce 50 Mooney viscosity masterbatches—is described. The high oil capacities were obtained by reducing the amount of low molecular weight polymer normally formed in GR-S type emulsion polymerizations.

Three modifiers, viz., tertiary dodecyl (Sulfole), mixed tertiary (MTM) and tertiary hexadecyl mercaptan were compared in butadiene-styrene copolymerizations at 41°F. using iron-pyrophosphate activation. When all the modifier was added initially, MTM produced the highest average molecular weight polymer. Tertiary hexadecyl mercaptan gave higher intrinsic viscosity values at low conversions. Sulfole gave the broadest molecular weight distribution and the lowest average molecular weight on the basis of intrinsic viscosity-conversion curves. Tertiary hexadecyl mercaptan has been considered to be the most acceptable modifier for the production of polymer for oil extension up to 60 percent conversion because its use resulted in the least formation of low molecular weight polymers during the initial stages of the reaction. Oil capacities of these polymers increased as the average molecular weight of the polymer, as measured by intrinsic viscosity, increased. Physical evaluation data for these polymers are presented.

Incremental addition of modifier reduced the amount of low molecular weight polymer and increased the oil capacity. The conditions of incremental addition of modifier to produce the highest molecular weight soluble polymer at 60 percent conversion are described. The oil capacity of the masterbatch, measured with reference to masterbatch Mooney or tensile, increased as the amount of low molecular weight polymer was decreased. The high oil loading permits the addition of higher than normal amounts of carbon black during compounding with a resultant reduction in cost. Physical test data are reported for laboratory and factory evaluations.

Modifier-free polymerizations at 41°F. were investigated. These produced gelled polymers with high oil capacity. Physical properties of oil masterbatches of the gelled polymers reflected the high oil content but not the effects of gel. The concept of gel and its effects in this system are discussed.

The tensile strength-oil content data illustrate that the tensile strength of the masterbatch is approximately proportional to the polymer content. The oil acts only as an extender and an easy processing aid.

Coatings Protect Against Abrasion and Corrosion

SEVERAL new Magic-Vulc coatings have recently been developed by the Magic Chemical Co., 121 Crescent St., Brockton 2, Mass., to protect industrial equipment from abrasion and corrosion. These new coatings, based on polyvinyl chloride, are said to be easy to apply by brush, spray gun or dipping, on metal, wood, concrete, fabric, and many other surfaces. They dry to tough, flexible finishes, and the company claims they are ideal for protecting tanks, racks, trucks, pipes, fans, blowers, and other equipment in a great variety of industries. For example, they have been successfully used on fume ducks used to carry fumes of nitric acid, hydrofluoric acid and other highly corrosive chemicals.

The new Magic-Vulc coatings are available as coatings of vinyl resin-pigment-solvent systems and coatings of vinyl plastisol. They are said to differ from other vinyl coatings in that they are 100 percent non-volatile and make use of heat to obtain the desired properties. The natural state of plastisol is a liquid and when applied to an object and heated to 350° F. for a few minutes, it "sets" to a solid, tough, flexible film. Since no solvent or liquid vehicle is present, the coating does not shrink when converted to a solid film. One application often gives all the thickness desired.

Numerous special properties are outlined by the company for these new coatings. For instance, they protect against the corrosive action of chemicals, mildew, fungi, and tropical and seashore climates; serve as electric insulators and dielectrics; withstand wide ranges of temperature as well as thermal shock; are water-resistant, non-porous, non-flammable, odorless and tasteless; adhere strongly to a wide variety of surfaces, including old paint; withstand vibration; are completely flexible and will not chip or crack on flexible surfaces; are quick-drying, flow easily and fill cracks; are easy to clean and may be scrubbed with alkalis, and are available in bright colors.

As indicated, the new Magic-Vulc plastisols are suitable as anti-corrosion coatings for many applications. In addition, they are used as material for molding and casting films, sheets, dolls, glass yarn, etc. The Magic Chemical Co. also has facilities at its Brockton plant for applying these plastisols, when desired.

Continental Instrument and Control Boards. (Bulletin No. 700). Continental Electrical Equipment Co., Box 1055, Cincinnati 1, Ohio. 8½ x 11 in. 8 pp.

Containing valuable information for the electrical specifier and plant operating man, this bulletin provides illustrated descriptions of some of the instrument boards and control switchboards produced by the company. An interesting section of the booklet is devoted to a presentation of power switchgear assemblies built by the company according to standard N.E.M.A. designs.

Importance of Rubber Hose for Material Handling

By J. A. MULLER

Executive Engineer, Thermoid Co., Trenton, N. J.

AN often forgotten tool of material handling is the industrial rubber hose. For years, huge tonnages of liquids in bulk of all types have been pumped over considerable distances through hose. Today, rubber hose has become an important carrier of solids in various forms as well. Present day techniques in rubber hose manufacture make it possible to handle any material that can be pumped. Sufficient bursting strength can now be built into a hose to withstand high pressures by metal or fiber braid reinforcement in the body. Abrasion or chemical resistance can be compounded into the stock from which the tube is made.

Here are some of the advantages in using hose as a material handling tool:

(1) For short distances, transporting material by hose is cheaper than some other methods.

(2) Greater flexibility. Whereas metal pipes or conveyor belts are fixed, the discharge end of the hose can easily be moved from hold to hold of a ship, for example, or from stockpile to stockpile.

(3) Less installation expense for auxiliary equipment. No supporting structure, rollers, etc., are required. Protection of the hose at vehicle crossings and against contact with high temperature metal is about all that is required.

(4) Less maintenance is required than for pipes or conveyors. No inspection or greasing of rollers.

(5) Less loss by spillage because a hose completely encloses the material it carries.

(6) There are no moving parts to wear out or break and no safety problem.

(7) Inasmuch as a hose is usually designed for installation in sections coupled together, it is a simple matter to shorten the hose when required or to lengthen it within limits.

(8) A hose can be easily moved from one location to another and reused several times.

(9) Follows an irregular path and can bend around corners.

(10) Will transport material straight up or straight down.

Here are a few of the jobs in material handling of solids and semi-solids that are being done by hose:

(A) In loading and unloading railroad box cars of grains, pneumatic systems using hose represent a vast improvement in time and spillage over old hand and batch methods.

(B) Rock dusting in coal mines is done efficiently by hose, making it possible to carry the dust into each crack and crevice in an irregular surface.

(C) Plaster is mixed in a central place in large quantities and is sprayed on walls at a distance from the mixing station by hose.

(D) Concrete is pumped through hose in many instances, including the specialized process of gunniting.

(E) Hot asphalt at 400°F. mixed with sand is pumped through hose in road building.

(F) Roofing material composed of hot tar, sand, and pebbles is pumped straight up to the roof from mixing vats on the ground.

(G) In the phosphate mining fields of the south, heavy flexible hose joined together by special rubber flanges provides high capacity ability with flexibility.

(H) Refined cement rock is pumped along a one-half mile pier in a rubber hose which is moved from hold to hold in the ships and up and down according to changes in the tide by means of a boom.

(I) Crushed ice is sprayed into railroad cars to preserve perishable goods.

(J) Pumping insulation into hard-to-reach spaces.

(K) Fish are pumped through hose.

This list of present applications of industrial rubber hose to material handling uses could be expanded several times. It should be remembered that new rubber compounds are being manufactured to resist abrasion and chemical action. Rayon, nylon or steel impart greater bursting strength than was possible even a few years ago. Better integral couplings and flanges to join hose to pumps and other equipment are now available. Processing and material handling engineers can often save money and improve the efficiency of material handling systems by the use of modern industrial rubber hose.

NOBS Special Accelerator

A new rubber chemical, NOBS Special Accelerator, developed for increased protection against processing scorch in rubber compounds, has been announced by the Intermediates and Rubber Chemicals Department of American Cyanamid Company, Bound Brook, N. J. Designed for use with high pH reinforcing blacks, it extends the safe processing period of scorchy stocks as much as ten minutes, according to the company. The increased delayed action allows mold flow in the first few minutes of the cure cycle and reduces surface defects and flow cracks.

Chemically, NOBS Special is n-oxydiethylene benzothiazole-2-sulfenamide. It is supplied in the form of tan, dustless flakes. Its specific gravity is 1.37 and it melts completely at 90° C. Stability at normal warehouse temperatures is excellent, the company states. The low melting point insures good dispersion at normal temperatures of mixing.

In natural rubber-furnace black tread stocks with sulfur ratios of 1.75 to 2.25%, the use of 0.5 to 0.7% NOBS Special is recommended by Cyanamid. GR-S-furnace black tread stocks with sulfur ratios of 1.75 to 2.00% require 0.8 to 1.0%. Good physical properties and aging qualities are obtained with these recommended dosages, Cyanamid states. If faster cures are required or NOBS Special is used with oil-extended GR-S, some additional activation is necessary. In such cases, the company recommends the use of small quantities (0.1 to 0.15%) of diphenylguanidine.

American Cyanamid Company recommends NOBS Special for tire treads and molded products containing high pH furnace blacks. Good results are reported when it is used in floor tiles, heels, soles, wire insulation and other products. However, when no furnace blacks are used some activation is required by basic materials such as the guanidines, thiuram mono sulfides or lime.

GLOSSARY OF TERMS
Used by the Mechanical Rubber Goods Industry

THERE has been a long-felt need for a glossary of terms used by the mechanical rubber goods manufacturing industry. Towards that end the Technical Committee of the Mechanical Division of the Rubber Manufacturers Association, Inc., has been working for over a year and has now compiled such a list of terms. While this list cannot by any means be considered as definitive, it is undoubtedly a most comprehensive one and represents the combined experience of various branches of the entire industry.

In a joint cooperative effort, both domestic rubber journals are publishing the list of terms as compiled to date. Suggestions as to additions, deletions, changes, etc., are most welcome and should be sent to: E. A. Foote, Rubber Manufacturers Association, 444 Madison Ave., New York 22, N. Y.

(EDITOR'S NOTE: Subcommittee VIII on Nomenclature and Definitions of Committee D-11 on Rubber and Rubberlike Materials of the American Society for Testing Materials has been working on a similar glossary for many years, and coincidentally copies of this list were furnished to members within recent weeks. The ASTM list covers terms relating to rubber and rubberlike materials and is currently undergoing revision. Information on the ASTM glossary can be secured from A. W. Carpenter, B. F. Goodrich Co., Akron, Ohio).

A

ABRADED: Worn away by friction.

ABRASION: Wearing away by friction.

ACCELERATED SERVICE TEST: A service or bench test in which some service condition, such as speed, or temperature, or continuity of operation, is exaggerated in order to obtain a result in shorter time.

ACCELERATED LIFE TEST: (1) A laboratory test procedure which has been intensified to reduce the time of exposure to reach an end point. (2) Any set of test conditions designed to reproduce in a short time the deteriorating effect obtained under normal service conditions.

ACCELERATION HOWL: An audible sound occurring when surface speed of a "V" belt drive is suddenly changed.

ACCORDION-FOLDED: Folded alternately upwards, and downwards, producing a sinusoidal disposition of the fabric strip in the cross section.

ACID RESISTANT: Withstands the action of acids.

ADAPTER: An end ring-shaped, on the side toward the packing, to conform to the shape of the packing—as for instance, convex V, concave V, etc.

ADHERE: (1) To cling or stick together. (2) To cause to cling or stick together.

ADHESION: (1) Basically, the adhering, clinging, bonding or sticking of two material surfaces to one another, such as rubber to rubber, rubber to glass, rubber to metal, rubber to wood, rubber to fabric, rubber to cord, rubber to wire, etc. (2) Refers to the strength of bond between cured rubber surfaces or cured rubber surface and a non-rubber surface.

ADHESION (PACKING): A condition which develops in service or bench tests, under static conditions, wherein the packing grows fast to the rigid member.

ADHESION FAILURE: (1) The separation of the two surfaces with a force less than specified. (2) The separation of the two adjoining surfaces due to service conditions.

ADHESIVE: A material which, when applied, will cause two surfaces in contact with each other to stick together.

ADHESIVE COATING: A surface layer applied to any product to increase its adherence to an adjoining surface.

ADHESIVE FABRIC: A fabric with a surface treatment which will bond two surfaces together when interposed between the surfaces. Also may be used to adhere to only one surface, such as friction tape used in hose building.

AGING: To undergo changes in physical properties with age or lapse of time.

AGING, AIR OVEN: A means of accelerating the change in physical properties of rubber compounds by exposing them to the action of air at an elevated temperature.

AGING, AIR PRESSURE HEAT: A means of accelerating the change in physical properties of rubber compounds by exposing them to the action of air under pressure at an elevated temperature. (See Air Bomb).

AGING, OXYGEN BOMB: A means of accelerating the change in physical properties of rubber compounds by exposing them to the action of oxygen at an elevated temperature and pressure.

AIR BOMB: Similar to an oxygen bomb but used with air. Used for accelerated aging test.

AIR CHECKS: Surface markings or depressions due to trapping air between the material being cured and the mold or press surface.

AIR CURING: The vulcanization of a rubber product in air as distinguished from vulcanizing in a press or steam vulcanizer.

AIR LOCKS: See Air Checks.

AIR MARKS: See Air Checks.

AIR SHOTS: See Air Checks.

AIR SPOT: Surface unevenness due to volume of stock being insufficient to fill the mold cavity.

AIR TRAP: See Air Checks.

ALIGN: To locate in a common line or common plane.

ALIGNMENT: (1) Position or place in line. (2) In V-belt drives, the condition of having all sheaves of each belt in the drive located so that the plane through center of each groove and at right angles to the axis coincides with the similar planes through corresponding grooves in the other sheaves.

AMBIENT TEMPERATURE: The environment temperature surrounding the object under consideration.

ANCHORAGE: Means of obtaining adhesion of rubber-to-rubber, rubber-to-fabric, rubber-to-metal, or rubber to other material.

ANGLE OF BRAID: The angle between any yarn, strand, or filament of the braid and a line parallel to the axis.

ANGLE OF LAY: The angle developed at the intersection of a strand and a line parallel to the lineal axis.

ANGLE OF REPOSE: The maximum angle from the horizontal of an inclined plane on which a body will not slide.

ANGLE, V-BELT: The angle formed at the intersection of the projection of the driving sides.

ANGULAR MISALIGNMENT (PIPE): Difference between 180° and the angle between axis of one pipe to be joined and an intersecting line parallel to the axis of the other.

ANTI-EXTRUSION RING: A rigid or semi-rigid ring employed at one or both ends of a packing set, primarily to prevent extrusion into clearances.

ARC OF CONTACT: (1) The portion of a curved surface which is engaged. (2) In belts, it refers to the portion of a pulley which is engaged by the belt and is usually expressed in degrees.

ARCH (EXPANSION JOINT): A convolution in the cylindrical wall.

ARMOR: A protective covering over a hose applied as a braid or spiral to prevent physical abuse.

ARMORED: See Armor.

ARMY DUCK: A very closely woven duck with plied yarns in both warp and filler designated by ounces per running yard of a prescribed width.

ASBESTOS: A fibrous mineral from which fine fibers of appreciable length may be separated.

ASBESTOS FIBER: (1) (Scientific) — The sub-microscopic fibrous element of one of the asbestiform minerals. (2) (Commercial)—Incompletely separated fiber bundles resulting from the processing of an asbestos mineral.

ATMOSPHERIC CRACKING: Cracks produced in surface of rubber articles by exposure to atmospheric conditions.

AVERAGE MODULUS: Total change of stress divided by total change of strain, i.e., the average slope of the stress-strain curve. Employed when modulus varies from point to point.

AXIAL SEAL: A shaft seal in which the packing member approaches the surface to be sealed in an axial direction.

AXIAL STRESS: Stress directed against, or by, a packing in the axial direction.

B

BACK FLASH: See Back Rind.

BACK FLOW: See Back Rind.

BACK FOLLOWER (CUP): The piston, or portion thereof, to which a cup is bolted.

BACKING: (1) A layer or liner of material on the underside of a sheeted product for mechanical reinforcement. (2) A soft rubber layer between tube and/or cover and carcass to provide adhesion.

BACKING PLATE (CUP): Same as Back Follower.

BACK RIND: Distortion at the mold parting line, usually in the form of a ragged or torn indentation.

BACK-UP PLATE (CUP): Same as Back Follower.

BAG CURE: A method of vulcanization wherein a flexible bag is used to impart positive pressure to the article being vulcanized.

BANBURY MIXER: A specific type of internal mixer used to incorporate fillers and other ingredients.

BAND: (1) In tires, two or more pieces of bias-cut rubber-coated cord or wire fabric, spliced endless, which form the plies that reinforce and shape the tire. (2) A metal ring which is welded, shrunk, or cast on the outer surface of a hose nipple. (3) A flat flexible strip of metal used on the outside of hose to bind the hose to the coupling, fitting, or nipple.

BAND, PINCHED: A deformation or contraction in a strip of rubberized cord or wire fabric distorting it from its normal plane.

BAND, TORN: A cut or tear in a strip of rubberized cord or wire fabric.

BAND, WRINKLED: A ridge, furrow, or crease in a strip of rubberized cord or wire fabric.

BARE BACK: The textile face of an article which is free of any treatment or covering.

BARE DUCK: The duck surface of a fabricated article wherein the exposed duck surface is free of treatment or covering.

BARE DUCK BELT: A belt in which at least one side has the exposed duck surface free of any covering.

BASE DIAMETER: Same as Heel Diameter.

BASE GUM: The rubber compound forming the narrower trapezoidal portion of a V-belt adjacent to but below the tension member.

BASE OF THREAD: The surface from which the thread projects.

BASE THICKNESS (CUP, HAT PACKING OR U PACKING): Axial dimension of base.

BEADING: Material used as a filler in a seam.

BEATER-PROCESS PAPER: Paper in which most or all of the binder (generally rubber) is added to the fibers before forming the sheet on a paper machine.

BELLOWS: Same as Cylindrical Diaphragm.

BELT DUCK: An open weave duck made from plied yarns with strength predominantly in the warp direction, used primarily in the manufacture of belts.

BELT FASTENER: A device for holding the ends of belt together.

BENCH TEST: A modified service test in which the service conditions are approximated, but the equipment is conventional laboratory equipment and not necessarily identical with that in which the product will be employed.

BEND: (1) To bring into a curve or out of a straight line. (2) The bend of a hose from a straight line expressed in degrees per foot of length or in radius of bend.

BENDING MODULUS: Force required to induce bending around a given radius, and hence a measure of stiffness.

BEVEL END (PACKING SET): A convex or concave conical face on one end ring. Bevel angle, where given, is the base angle of the cone.

BEVEL JOINT (PACKING RING): A cut along a plane inclined to the axis but intersecting it in the center of the ring. Bevel angle, where given, is to the face of the ring.

BIAS CORD BREAKER: Cord breaker fabric cut on a bias angle.

BIAS CUT: A cut of a textile material made diagonally at an angle less than 90° with the direction of the warp threads.

BIAS LAID: Material laid on or wrapped around so that the threads are at an angle of less than 90° to the longitudinal axis.

BIAS SEAM: A seam in which the material to be joined is cut on a diagonal.

BINDER: The component of any non-homogeneous rubber product that holds it together, i. e., rubber component of asbestos sheet packing.

BITE: The nip of a pair of rolls revolving toward each other as in a mill or calender.

BLEED CONNECTION: A connection to a lantern ring within a set, or to the space between two packings, to bleed away leakage.

BLEEDING: Migration to the surface of plasticizers, waxes, or similar materials to form a film or beads. Also see Bloom.

BLEMISH: A mark, deformity, or injury which impairs the appearance.

BLISTERS: A raised spot on the surface or a separation between layers usually forming a void or air-filled space in the vulcanized article. (See Bubbles, Sinks and Voids).

BLOCK END: A layer or layers of rubber or reinforceing materials in the end build-up of a hose used to satisfy dimension requirements.

BLOCK SIDES (BLOCKED SIDES OR SIDE IRONS): Belts or rubber sheet cured between side bars of metal or other rigid materials for pressure and dimensional control.

BLOOM: A discoloration or change in appearance of the surface of a rubber product caused by the migration of a liquid or solid to the surface. Examples: sulfur bloom, wax bloom. Not to be confused with dust on the surface from external sources.

BLOW: (1) A soft area caused by porosity below the surface. (2) The volume expansion during the forming of sponge rubber expressed in per cent.

BLOW-UP: (1) A blister between plies of an article. (2) The inflation of hose or tubing prior to vulcanization.

BLUE ASBESTOS: Same as Crocidolite.

BLUSH: See Bloom.

BODY RING (EXPANSION JOINT): A reinforcing ring, generally of metal, in the carcass to increase ability to support pressure.

BOLT CIRCLE: Circle passing through center of bolt holes. (See Bolt Hole Circle).

BOLT HOLE CIRCLE: That perimeter along which the center of bolt holes in a flange face are distributed. (Pertinent information is the diameter of the bolt circle, and the number and size of the bolt holes).

BOND: See Adhesion.

BOOT: A diaphragm, generally of the bellows type, employed at little or no pressure differential to exclude moisture, dirt, etc., from a concentric joint.

BOOTLEGGING: (1) Progressive ply delamination. (2) The separation of plies in belting due to flexing.

BORE: A fluid passageway.

BOTTOM COVER: The protective rubber cover on the surface contacting the driving mechanism of a conveyor belt. (See Pulley Cover.)

BOW: (1) Curvature from flat plane in the surface. (2) The deviation from the straight line of the fill yarn in a fabric. (3) The deviation from a straight line of a product when unrolled and laid on a flat surface.

BOWL: The exterior shell of an expansion ring coupling into which the hose or conduit is inserted.

BRAID: A hollow or solid structure of round or polygonal cross section, produced by interlocking yarn strands or filaments which are disposed in direction oblique to the axis of the braid.

BRAID, ANGLE OF: See Angle of Braid.

BRAIDED HOSE: Hose in which the reinforcing material has been applied by braiding.

BRAIDED PLY: A ply of braided reinforcement.

BRAIDER: A machine for making braid. The yarn is drawn off of several bobbins while they move in and out during their travel around the center of the machine. These yarns are thus intertwined in a regular manner according to the desired pattern.

BRAIDED SMASH: A defect in the braided reinforcement caused by one or more of the ends of reinforcing material breaking during the braiding operations.

BRAID-OVER-BRAID: A braid made by more than one pass through a multiple-carrier braider.

BRAID PHOTOGRAPHING: The bas-relief or outline of the braid showing on the cover of braided hose after vulcanization. Most prominent when cover thickness is thin.

BRAID, WIRE: See Wire Braid.

BRAND: A label identifying the product and/or manufacturer. The label may be either embossed, inlaid or printed.

BRAND MARKS: The mark or marks used to establish the identity of the product.

BREAK: A separation or discontinuity in any part of an article.

BREAK-AWAY FRICTION: Same as Break-out (Packing).

BREAK-OUT (PACKING): Force to inaugurate sliding. Expressed in same terms as friction. An excessive break-out value is taken as an indication of the development of adhesion.

BREAK-OUT FRICTION (PACKING): See Break-out (Packing).

BREAKTHROUGH: A break in the surface caused by an internal stress and/or failure.

BRITTLE: Easily broken or snapped when bent or deformed.

BROWNIAN MOVEMENT: A ceaseless, erratic motion of the suspended particles in colloidal solutions. The movement is the result of the impact with the molecules of the surrounding medium.

BRUSH FINISH: The finish on a sand cast fitting obtained by wire brushing.

BUBBLES: Usually referring to surface blisters. (See Blisters).

BUCKET COVER: The cover of an elevator belt next to the carrying buckets. (See Top Cover).

BUFFING: To grind the surface producing a roughened or a velvety surface. Usually done to produce dimensional conformance.

BUFFING MARKS: Results of buffing operation. (See Buffing).

BULGE: A protuberant deformation due to application of a force or load.

BUTT JOINT (PACKING RING): A cut along a plane passing through the axis.

BUTT SEAM: A seam made by placing the two pieces to be joined edge to edge.

C

CABLE CORD: Cord made from cable twist yarn.

CABLE LAY: Same as spiral lay in which the reinforcement consists of multiple strands.

CABLE TWIST: A cord or rope construction in which each successive twist is in the opposite direction to the preceding twist, i.e., S-Z-S, Z-S-Z.

CABLED YARN: A yarn made by twisting together two or more ply yarns. They may be made with cable or hawser twist.

CALENDER STOP: Mark left on the surface of rubber sheet or sheeting due to interruption of calender roll motion.

CANADIAN ASBESTOS: Same as Chrysotile.

CAPPED EDGE: A rubber protective edge placed around a product internally reinforced with textile or other material.

CAPPED ENDS: A seal on the end of a product to protect internal elements.

CARCASS: The fabric, cord, and/or metal reinforcing section of any rubber product, such as belt or hose, as distinguished from the rubber tube or rubber cover. (Also see Ply, Reinforcement).

CARRY SIDE COVER: See Top Cover.

C.B.S. (CLOTH BOTH SIDES): A common abbreviation used to describe a sheet consisting of a ply of fabric or cloth on each surface with a sandwich of rubber between them.

C.B.S. SHEET: Similar to C. I. sheet except that two fabric plies are exposed on the surfaces, generally not frictioned on the exposed sides. (See C.B.S.).

CEMENTED EDGE: An application of cement around the edge of a fabricated product with or without internal reinforcement for protection or adhesion. (A form of Capped Edge).

CEMENTED END: A capped end accomplished by means of cement.

CENTERING RING: An extension of a gasket for the purpose of locating it centrally on a flange.

CENTER-PACKED: A variety of outside-packed in which the plunger enters fluid space at both ends.

CENTER YARN: A straight yarn introduced into the center of a solid braid, to increase the cross section.

CENTRIFUGAL FORCE: That force which tends to impel a thing, or parts of a thing, outward from a center of rotation.

CENTRIPETAL FORCE: Force exerted against a body whereby it is compelled to move in a circular arc.

CHAFER: A duck of approximately square woven construction made with single or ply yarn warp and filling.

CHAFER DUCK: See Chafer.

CHALKING: Formation of a powdery surface condition due to distintegration of surface binder or elastomer due in turn to weathering or other destructive environments.

CHAMFER: To remove a sharp edge either by beveling or rounding.

CHANNEL GASKET: A gasket of channel cross section.

CHARGE MARK: The mold mark in a lead press hose cover caused by the stopping of the lead press to add another lead billet to the press.

CHECKING: Short shallow cracks on the surface generally due to effect of destructive action of environmental conditions.

CHIRP: Intermittent squeak of a V-belt operating in sheaves.

CHORD MODULUS: A modulus calculated from the slope of the cord of a stress-strain curve, connecting one point on the curve with the origin. This term is not in general use.

CHURN: (1) A vessel in which rubber compounds are stirred into solvents. (2) To stir or mix.

CHRYSOTILE: A fibrous magnesium silicate, the most important asbestos mineral used for the preparation of yarns and compressed asbestos sheet.

C. I. CLOTH-INSERTED: An abbreviation used to indicate a sheet of rubber containing one or more plies of cloth or duck, in which the cloth is completely covered with rubber.

CIDER CLOTH: A square woven, open-mesh fabric, made from coarse ply yarns.

CIRCULATION CONNECTION: A sealing connection in which part of the sealing fluid returns via a second port. Designed to both seal and cool.

C. I. SHEET: See C. I. Cloth-Inserted and Cloth Insertion Sheet.

CLOTH-BOTH-SIDES SHEET: See C.B.S. Sheet.

CLOTH IMPRESSION: Same as Fabric Impression.

CLOTH INSERTION SHEET: See C. I. Cloth-Inserted.

CLOTH-ONE-SIDE SHEET: See C.O.S. and C.O.S. Sheet.

COAT: A layer of material covering a surface.

COEFFICIENT OF THERMAL EXPANSION: Average expansion per degree over a stated temperature range, expressed in a fraction of initial dimension. May be linear or volumetric.

COG: A tooth on the rim of a wheel or rubber product.

COGGED V-BELT: A V-belt cut or produced with a series of evenly spaced V-shaped indentations in the inner face. (See Notch).

COLD CHECK: A split, crack, fissure, or interruption of smoothness in calendered sheets caused by improper warming of the stock or temperature of rolls.

COLD FLEX: Act or instance of bending or bowing a rubber product under conditions of cold environment.

COLD FLEXIBILITY: Flexibility following exposure to a predetermined low temperature for a predetermined time.

COLD FLOW: Continued deformation under stress. (See Creep and Drift).

COLD RESISTANT: Withstands the effect of cold or low temperatures without loss of serviceability.

COMMERCIALLY SMOOTH: Degree of smoothness of the surface of an article which is acceptable for use.

COMPOUNDER'S MODULUS: A stiffness measurement extensively used by rubber technologists and is expressed as "modulus at 300%" or "300% modulus" (any other per cent elongation may be indicated but 300% is very commonly used). By this is meant the tensile stress at the indicated elongation.

COMPRESSED ASBESTOS SHEET: A sheet prepared from a rubber compound containing a high percentage of asbestos fiber and volatile solvent, by the use of a special calender (sheeter) in such a manner that the solvent is volatilized and the compound is caused to build up as an oriented sheet on one roll of the sheeter.

COMPRESSIBILITY: The property of exhibiting compression under load. In case of sheet material the per cent loss of thickness when subjected to a given load applied by a disc of given diameter for a predetermined short time and at a predetermined temperature as defined in ASTM D-1147.

COMPRESSIBLE (GASKET): Exhibiting compression under stress. Sometimes limited to products which exhibit volume compression; thus, rubber products containing no voids are said to be "incompressible."

COMPRESSION (GASKET): Reduction in one dimension as the result of application of stress. May or may not be accompanied by increase in other dimensions.

COMPRESSION MODULUS: The ratio of the compressive stress to the resulting compressive strain (the latter expressed as a fraction of the original height or thickness in the direction of the force). Compression Modulus may be either static or dynamic.

COMPRESSION SET: The deformation which remains in rubber after it has been subjected to and released from a specific compressive stress for a definite period of time at a prescribed temperature. Compression set measurements are for the purpose of evaluating creep and stress relaxation properties of rubber.

CONCAVITY FACTOR: Rubber has no elastic limit and the entire stress-strain curve is concave towards the stress axis or away from the strain axis. The relative amount that rubber varies from the Hookes' Law ideal curve is known as "concavity factor" determined as the ratio between the energy of the extension curve to the straight line curve to the same point. It may be expressed as:

$$\frac{\text{Proof resilience}}{\frac{1}{2}\text{ Tensile product}}$$

CONCENTRIC JOINT: A joint between concentric cylindrical members.

CONDENSER FERRULE: A tube sheet ferrule used in a surface condenser.

CONDUCTIVE: A rubber having qualities of conducting or transmitting heat or electricity. Most generally applied to rubber products used to conduct static electricity. (See Conductivity).

CONDUCTIVITY: Quality or power of conducting or transmitting heat or electricity.

CONE: A sliding packing, convex-conical on one face and concave-conical on the other, operating against any inner reciprocating or rotating member. Used alone or in sets.

CONFORMITY COEFFICIENT: Same as "M" Value.

CONFORMITY (GASKET): Degree or accuracy of fit between gasket surface and surface of rigid member.

CONTACT-PRESSURE RATIO: Same as "M" Value.

CONTACT STAIN: When staining occurs on the area of an object directly in contact with the rubber article it is known as "contact stain."

CONTRACTION: Opposite to elongation or to expansion.

CONTROL: A product of known characteristics which is included in a series of similar service or bench tests to provide a basis for evaluation of one or more unknown products.

CONVEYOR COVER: Term applied to the protective covering of conveyor belts. Generally a rubber covering applied during manufacture as a separate sheet to form a continous integral covering.

CORD: The product formed by twisting together two or more plied yarns.

CORD BREAKER: Openly spaced cord fabric performing the same function as a leno breaker or cider cloth.

CORE: (1) A strip, or assemblage of strips, of any materials introduced into the center of a solid braid. (2) The portion of a mold which forms the interior of a hollow article.

CORE CUT: Cut resulting from burr, nick, or rough edge on mold core. Usually occurring during removal of core.

CORKBOARD: Cork granules treated with a binder, compressed and sliced into sheets of desired thickness.

CORK-COMPOSITION GASKETING: Cork granules treated with a binder and sliced into sheet of desired thickness.

CORNER-YARN: A straight yarn introduced into an 8 carrier or multiple carrier braid to impart or intensify a square cross section.

CORROSION-INHIBITING (PACKING): A property of packing whereby it actively inhibits corrosion of adjacent metal faces.

CORROSION (PACKING): Corrosion of rigid member (usually metal) where it contacts packing. The actual corroding agent is fluid medium trapped in the interface.

CORROSIVE (PACKING): A property of packing whereby it is assumed, often incorrectly, to promote corrosion of the rigid member by the trapped fluid.

CORRUGATED COVER: See Lead Press Corrugated.

C.O.S. (CLOTH ONE SIDE): A common abbreviation used to describe a ply of fabric with a skim or sheet of rubber on one side of it.

C.O.S. SHEET: Similar to C. I. Sheet except that one fabric ply is exposed at the surface, generally not frictioned on the exposed side.

COVER: Outer covering usually intended as protective coating.

COUNT (FABRIC): The number of warp ends, of filler picks, or both, in a square inch of fabric.

COUPLED LENGTHS: Individual lengths of conduit or hose with couplings attached. This may be as specified either the length of exposed hose or the over-all length including couplings.

COUPLING: A device attached to the end of hose or conduit to facilitate connection to a suitable fitting and insure a passageway.

COUPLING (FEMALE): That portion of a coupling carrying the internal thread.

COUPLING (MALE): That portion of a coupling carrying the external thread.

COVER LAP: (1) The amount that a calendered cover extends over the starting edge. (2) Also see Cover Push-Backs.

COVER PUSH-BACKS: A wrinkle, lap or fold-over produced circumferential in the cover resulting from act of applying cover.

COVER SEAM: Mark or line resulting from applying cover from calendered stock.

COVER SPLICE: Mark, line or overlap resulting from the joining of two sections of calendered stock showing in the transverse direction.

COVER WEAR: The result of use, showing consumption or impairment due to use.

CRACKING: A sharp break or fissure in the surface. Generally due to excessive strain.

CRAZING: A surface effect on rubber articles characterized by multitudinous minute cracks.

CREAMING: The tendency in latex of rubber particles to rise like cream to the surface, leaving a higher proportion of serum in the lower layers.

CREASE: A wrinkle or fold.

CREEP: (1) The deformation occurring with the lapse of time, in both cured and uncured rubber, in a body under stress in addition to the immediate elastic deformation. Some related terms and properties are stress-relaxation, hysteresis, damping, flow, compression set, and viscosity. (See Cold Flow and Drift). (2) In belts, the action of a belt alternately losing speed on the driving pulley and gaining speed on the driven pulley.

CREEP-RELAXATION (FLANGE GASKET): The type of relaxation encountered in bolted flange joints, i. e., loss of stress accompanied by constantly decreasing compressed thickness.

CREST OF THREAD: The outermost section of the thread.

CRIMP: (1) The waviness of the yarn in a woven fabric. (2) The difference in distance between two points on a yarn as it lies in a fabric and the same two points when the yarn has been removed and straightened. Expressed as a percentage of the distance between the two points as the yarn lies in the fabric.

CROCIDOLITE: A fibrous iron silicate used for the same purposes as Chrysotile where resistance to mineral acids is desired.

CROCKING: A migration or blooming to the surface of pigments or fillers contained in a rubber compound.

CROSS-BAR GASKET: A tube sheet gasket consisting, in addition to the rim, of one or more strips crossing the central area, and serving to insulate some tube outlets from others.

CROSS EXPANSION PACKING: A form of slab packing in which most of the fabric plies are at an angle of 45° to the surface.

CROSS WRAP: Multiple layers of narrow tensioned wrapper spiralled circumferentially over the outside to apply external pressure during vulcanization. (See Wrapped Cure).

CRYSTALLIZATION: A change in physical properties resulting from the crystalline re-orientation caused by temperature.

CUP PACKING: A sliding piston packing of cup shape, i. e., with an axially extended outer rim. Less frequently used as a gasket.

CURE: The act of vulcanization.

CURE, LEAD PRESS: See Lead Press Cure.

CURE TIME: The time required to produce vulcanization at a given temperature. The cure time varies widely, being dependent on the type of compounding used, the thickness of the product, etc.

CURING TEMPERATURE: The temperature at which the rubber product is vulcanized.

CUSHION BREAKER: Leno or cord breaker imbedded in a layer of pure gum rubber.

CUT: The number of 100 yard lengths in a pound. Employed to describe the weight of asbestos yarn.

CUT (ASBESTOS YARN): See Cut.

CUTTING RESISTANT: Withstands the cutting action of sharp objects.

CUT OPEN (PACKING RING): Cut from coil or spiral, or, if initially endless, cut open with one or more joints.

CUT THREAD: (1) A thread produced by a lathe, screw-machine, or similar equipment, by the actual cutting out or removal of metal. (2) A narrow strand of rubber produced by cutting.

CYLINDER: The outer member with which a piston makes close fitting contact.

CYLINDRICAL DIAPHRAGM: A diaphragm in the shape of a cylinder, generally with one or more convolutions in the wall.

D

DAMPING: (1) The progressive reduction of amplitude in free vibration. (2) The friction of any kind in a free vibration system causing the motion to decrease gradually to the vanishing point.

DATE CODE: Any combination of numbers, letters, symbols or other methods used by a manufacturer to identify the period of manufacture of the product.

DEFORMATION: Any change of form or shape produced in a body by a stress.

DEPTH (PACKING RING OR SET): Axial dimension.

DENIER: A unit of yarn number. The number of unit weights of 0.05 g. per 450-meter length. A yarn numbering system based on denier units. Denier is equal numerically to the number of grams per 9000 meters.

DENSITY: The ratio of the mass of a body to its volume or the mass per unit volume of the substance. For ordinary practical purposes, density and specific gravity may be regarded as equivalent.

DEPRESSION: A place or part that is depressed; a hollow.

DEPTH OF THREAD: The distance between the crest and base of the thread, measured normal to the axis.

DIAGONAL RING: A pair of mating packing rings, one of which has one face convex-conical and the other has one face concave-conical.

DIAMETER: The length of a straight line passing through the geometric center to the periphery of an object.

DIAMETER, INSIDE: The length of a straight line through the geometric center and terminating at the inner periphery of a cored object.

DIAMETER, EFFECTIVE OUTSIDE: The mean diameter calculated from the circumferential measurements of an irregular cylindrical product.

DIAMETER, MAXIMUM: The greatest admissible diameter in a given case.

DIAMETER, MINIMUM: The least admissible diameter in a given case.

DIAMETER, OUTSIDE: See Diameter.

DIAPHRAGM PACKING: A packing between rigid members in relative motion which is attached to both members and absorbs the motion through its own deformation.

DIAPHRAGM SHEET: Sheet (generally fabric-reinforced rubber) from which flat diaphragms may be cut.

DIE CUT: (1) Shaped articles punched from a sheet of rubber with a die. (2) In extruded goods, a cut in the surface which may be intentional or a defect.

DIE-FORMED: Shaped in a forming die, generally without heat.

DIE-FORMED SPIRAL: A packing helix compressed to form a sleeve. Although sometimes referred to as "solid," it corresponds in fact to a ring with a very shallow bevel joint making one or more complete turns.

DIELECTRIC: The electrical potential strength or nonconducting properties of a rubber product. (See Dielectric Strength).

DIELECTRIC STRENGTH: The measure of electric potential strength of a rubber product. Measure of its ability as an insulating compound to resist passage of a disruptive discharge produced by an electric stress. Measured as volts per mil of thickness.

DIFFERENTIAL DIAPHRAGM: A diaphragm between two fluids at substantially different pressures.

DIFFUSION: (1) Commonly used to express the flow or loss of a gas under pressure through a rubber layer. (See Effusion). (2) The striking through as in "frictioning."

DILUENT: A diluting agent. Any liquid or solid which when added to another liquid or solid reduces the quantity per unit volume of the base material in the final total volume.

DIMER: A polymer whose molecule is believed to consist of only two molecules of the monomer.

DIP COAT: A thin coat on a surface obtained by dipping the material to be coated into the coating material.

DIPPED FABRIC: Coated with rubber compound by passing through a rubber solution and drying.

DISC HOLDER: The metal disc of a poppet valve when designed to accommodate a rubber valve disc.

DISC RETAINER: A washer used to clamp a rubber valve disc to the disc holder.

DISHED: A depressed surface distortion of a flat or curved section of a rubber product.

DISHED DIAPHRAGM: A molded diaphragm in which the entire center is depressed below the plane of the rim. Designed to permit longer travel than a flat diaphragm of the same diameter.

DISPERSION: A heterogeneous system consisting of a continuous phase and one or more discontinuous phases.

DOMED: A raised surface distortion of a flat or curved section of a rubber product.

DOG EARS: See Horseshoe.

DOG LEG: (1) A bending from a straight line. (2) A bend from a straight line in a vertical braided hose caused by the stopping-starting of the lead press to insert a billet of lead. (See Charge Mark). (3) A bend from a straight line in a V-belt caused by the press laps.

DOUBLE ACTING PISTON: A piston with fluid on both sides.

DOUBLE FILLING DUCK: A type of flat duck with a plied yarn filling.

DOUGHNUT RING: Same as O-ring.

DRIFT: (1) Continued deformation under strain. (2) The change in a given durometer reading after a period of time.

DROP PLY: (1) The omission of a reinforcing ply for a specified distance from each edge. Usually the bottom or next to bottom ply in flat conveyor belting. (2) The dropping of a ply in a multi-ply cord.

DRY: (1) Absence of tack, no adhering properties. (2) To remove moisture.

DUCK: A term applied to a wide range of medium and heavyweight fabrics, commonly made of cotton, including the heaviest and strongest of all single-woven fabrics. There are three main types: number duck, army-type duck and flat duck. The first two are always plain woven from ply yarns in warp and filling; the latter is plain woven with two single ends weaving as one and with either single or ply filling. Army-type ducks, as compared with number ducks, have a lighter thread count, finer yarns and generally are lighter in weight. The yarns are usually coarse numbers and there may be up to 14 or more combined in making the ply yarns. Most ducks are very compactly woven and firm in texture but others are soft and pliable. Duck is also known as canvas, and many special names are used, e. g., belt duck, shoe duck, hose duck, harvester duck, etc.

DUCK AND RUBBER PACKINGS: See Slab Packing.

DUCK ON EDGE: Exposed threads of a carcass ply or breaker fabric through the cover edge of a rubber-covered belt.

DUROMETER: An instrument for measuring the hardness of rubber. Measures the resistance to the penetration of an indentor point into the surface of rubber.

DUROMETER HARDNESS: An arbitrary numerical value which measures the resistance to penetration of the indentor point of the durometer. Value may be taken immediately or after a very short specified time.

DYNAMIC MODULUS: The ratio of stress to strain under vibratory conditions. It is calculated from data obtained from either free or forced vibration tests, in shear, compression or elongation. It is usually expressed in p.s.i. for unit strain.

DYNAMIC PACKING: See Sliding Packing.

DYNAMIC RESILIENCE: The percentage of the vibrational energy which persists in the second of two successive free vibrations; also called "Vibrational Resilience."

DYNAMIC SEAL: See Sliding Seal.

E

EARS: Folds in the surface found prior to vulcanization that are not properly adhered.

ECCENTRIC: (1) (General)—Off center. (2) (Packing)—Having an axis not coincident with the axis of the moving member.

ECCENTRIC WALL: In hose or tubing, a condition where the wall gauge of a specific cross-section is substantially non-uniform.

ECCENTRICITY: In hose, tubing or cylindrical articles when inside and outside diameters deviate from a common center. Also see Eccentric Wall and Off Center.

ECCENTRICITY (PACKING): Radial distance between axis and that of the moving member.

EFFECTIVE DIAMETER (DIAPHRAGM): A diameter corresponding to that of a packed piston which would give the same thrust at the same fluid pressure. Generally assumed as midway between outside and inside working diameters.

EFFECTIVE LENGTH: The length of a belt under operating tensions.

EFFUSION: (1) The flow through a porous diaphragm. (2) The flow of a gas under pressure through a rubber tube or layer. See Diffusion.

EIGHT (8) CARRIER BRAID: A solid braid constructed on a maypole braider with 8 carriers, giving a square cross section.

ELASTICITY: The property of an article which tends to return it to its original shape after deformation.

ELASTIC LIMIT: (1) The greatest stress which a material is capable of development without a permanent deformation remaining upon complete release of the stress. (2) In rubber, the elastic limit as above defined is very low and sometimes practically non-existent. Usually this term is replaced by various load limits for specific cases in which the resulting permanent deformations are not zero but are negligible. (See Yield Point).

ELASTIC MODULUS: See Modulus.

ELASTOMER: An elastic rubberlike substance, such as natural or synthetic rubber.

ELONGATION: Increase in length expressed numerically as a fraction or percentage of initial length.

EMBOSSING: Operation of transferring a design to a rubber or rubber-like surface.

ENAMELING DUCK: An extra wide flat duck.

END: One of several parallel yarns delivered by a single braider spool.

END BLOCK: See End Reinforcement.

END BUILD: See Block End.

END REINFORCEMENT: A layer of reinforcing material applied to the end to provide additional strength.

END RING: Ring at one end of a packing set, generally an anti-extrusion ring.

ENDURANCE LIFE TEST: A laboratory procedure used to determine effective life of a rubber article when exposed to dynamic forces.

ENDURANCE TEST: Service or bench test, conducted to failure.

ENLARGED END: An end with inside diameter greater than that of the main body.

EXPANDER SPRING: A radial spring employed to drive a piston ring outwards against the cylinder wall, frequently of the wave type.

EXPANSION: The increase in any linear dimension or in volume.

EXPANSION, CUBICAL: (1) The volumetric expansion of a body due to temperature or pressure. (2) Of hose, is measured by locking a liquid at a specified pressure in the hose and then releasing the pressure at one end so that the liquid may rise in a burette as it resumes its normal size. It is generally given as cubic centimeters per unit of length.

EXPANSION JOINT (RUBBER): A flex unit employed in a more rigid conduit to absorb motion and/or vibration, and to correct initial misalignment.

EXPANSION RING COUPLING: A coupling in which the hose is compressed against an exterior shell by expanding a cylindrical ring of ductile material placed in the bore of the hose.

EXPOSED FABRIC: On hose where spots of fabric reinforcement show due to lack of cover, cap or seal end. (See Duck on Edge).

EXTENDED HEEL DIAMETER: (Cup, hat packing, U packing with curved corner): Diameter of line of intersection of extended working face with the plane of the base.

EXTENSION MODULUS: Same as Tension Modulus.

EXTRACTION (As Applied to Rubber): The separation of certain components from a solid by the process of dissolving them in a liquid solvent under suitable conditions.

EXTRUDED: Forced through die of tubing machine in either solid or hollow cross section.

EXTRUSION MARK: An elevated or depressed line on the surface of extruded items caused by imperfect dies or coarse particles lodged behind the die.

EXTRUSION (PACKING): Escape of packing through clearances.

F

FABRIC BRAIDED: A fabric woven on a braider.

FABRIC ENDS/INCH: The number of warp or filler threads per inch.

FABRIC IMPRESSION (SHEET OR SLEEVE): Marked with the imprint of fabric used as a wrapper during vulcanization.

FABRIC KNITTED: A flat or tubular structure made from one or more yarns or filaments whose direction is generally transverse to the fabric axis but whose successive passes are united by a series of interlocking loops.

FABRIC PICKS/INCH: The number of small yarns per inch running from edge to edge of cord fabric to hold the cords in place.

FABRIC SLAB: Thick sheet composed entirely, or almost entirely, of superimposed layers of rubberized fabric, generally bias cut.

FABRIC (TEXTILE): A planar structure produced by interlacing yarns, fibers, or filaments. (See Fabric Braided, Knitted and Woven).

FABRIC WOVEN: A flat or tubular structure composed of two series of interlacing yarns or filaments, one parallel to the axis of the fabric and the other transverse.

FACE SEAL: Same as Axial Seal.

FATIGUE: The weakening or deterioration of a material caused by a repetition of stress or strain.

FEATHERED EDGE: A wrapper cloth whose starting edge has had several warp threads removed.

FELT: A fiber mat produced by carding or other dry process.

FELT GASKETING: Felt, usually treated, intended for gasketing uses.

FERRULE: A metallic ring placed over the hose end, serving to attach the coupling to the hose. The ferrule may be crimped, forcing the hose in against the shank, or the shank may be expanded, forcing the hose out against the ferrule.

FIBER LENGTH: Average length of commercial asbestos fiber as determined by the standard Quebec shaking screen. Actually, the diameters of the fiber clots, rather than the length of individual fibers, are measured, and method of preparation influences results greatly.

FILL: See Weft.

FILLED ARCH: An arch which has been completely filled with soft rubber so that it does not provide a pocket for the accumulation of fluid.

FILLER: (1) A material incorporated into a rubber compound to increase its bulk. (2) A compound built into a rubber product to increase its bulk and/or improve its appearance. (3) Sometimes erroneously used to mean "filling" in textiles. (4) The transverse strength member in a circular woven reinforcement.

FILLER COAT: A skim of rubber or rubberlike material calendered onto the frictioned filler fabric. (See Skim or Skim Coat).

FILLER FABRIC: A fabric used as a filler.

FILLER FRICTION: A rubber or rubberlike impregnation of the filler fabric.

FILLER GUM: A rubber or rubberlike compound used as a filler.

FILLER RING: A ring of rubber or other material used to fill the hinge of a V-ring.

FILLER SEAM: Seam where filling material is placed in the void formed by the open seam.

FIN: See Flash.

FINGER SPRING: A spring of flat sheet metal, stamped with fingers.

FINISH, FABRIC: Same as Impression Fabric.

FINISH, PAPER: Finish resulting from curing in contact with paper.

FINISH PLATE: (1) Same as mirror finish. (2) (More Generally)—Same as Plated Finish.

FINISH, PLATEN: Finish resulting from curing in contact with commercially smooth but not polished press platen.

FIRE RESISTANT: Retards the burning action of fire or flame.

FISH SCALING: A scaly coating of the surface by overlap of thin plates or leafs of rubber, usually resulting from uneven flow through die or mold.

FLAME POLISH: The glossy surface produced on plastics by fusion of the surface accomplished by passing through a flame.

FLAME RESISTANT: See Fire Resistant.

FLANGE: (1) Metal ring attached to pipe nipples. (2) Raised edge on rubber articles.

FLANGED END: Turned up or raised end so made that it can be bolted to an adjacent flange.

FLANGE GASKET: A gasket employed in a flange joint.

FLANGE GASKET PRE-STRESS: Axial stress developed against, or by, a flange gasket at the time of initial tightening.

FLANGE GASKET RESIDUAL-STRESS: Axial stress developed against, or by, a flange gasket at some interval after initial tightening. Is less than pre-stress by the amount of combined relief and creep-relaxation.

FLANGE GASKET STRESS: Axial stress developed against, or by, a flange gasket.

FLANGE JOINT: A joint formed by two abutting flanges.

FLANGE PACKING: Same as Hat Packing.

FLANGE-RECTANGULAR: A raised edge with rectangular cross section.

FLANGE SQUARE: A raised edge of square cross section.

FLARE: A feature whereby the lip diameter differs from the heel diameter.

FLARE ANGLE: Angle between an element in the lip surface and a line parallel to the axis.

FLASH: Material protruding from the surface of a molded part, appearing at the mold parting line or mold vent points.

FLAT CURE: (1) A rubber compound with a curing rate at which physical properties change only slightly over a wide range of time for vulcanization. (2) A method of curing fire hose in a flat form.

FLAT DIAPHRAGM: A diaphragm packing in the form of a flat disc, designed generally for attachment to one member at the rim and to the other member at the center.

FLAT DUCK: A type of duck in which the warps are in pairs.

FLAT SPOTS: Flat areas on surface of mandrel cured hose caused by deformation during vulcanization.

FLEETING ANGLE: The angle of entry of a V-belt into the plane of the sheave groove.

FLEX CRACKING: A surface cracking induced by repeated bending or flexing.

FLEX LIFE: The relative ability of a rubber article to withstand dynamic bending stresses.

FLEXING LIFE TEST: A laboratory method used to determine the life of a rubber article when exposed to dynamic bending stresses.

FLEX TEST: A laboratory method used to evaluate the resistance of an article to repeated bending.

FLEXIBILITY: Opposite of stiffness.

FLOATING BREAKER: Leno or cord breaker imbedded in a cover, usually in the center of the top cover.

FLOW CRACKS: Surface imperfections due to improper flow and failure of stock to knit or blend with itself during the molding operation.

FLOWED-IN GASKET: A gasket made *in situ* by drying a solution or dispersion.

FLOW LINES: See Flow Marks.

FLOW MARKS: Similar to Flow Cracks, but the depressions are not quite as deep.

FLOW NUMBER: The number expressing the thickness of a pellet, after compression, in a flow plastometer. Usually associated with the Williams Plastometer.

FLUID RELIEF: Loss of gasket load resulting from the introduction of fluid pressure into the interior of a bolted flange joint, and consequent development of tension stresses in the walls of the container.

FLUSHING CONNECTION: A connection to a lantern ring located at the inner end of the packing set and fed with a large volume of sealing fluid.

FOLD: Where material is doubled over.

FOLD-BACK: See Fold-Over.

FOLDED (PACKING): Constructed from folded strips of rubberized fabric.

FOLDED-AND-DOUBLED: Roll-folded from both edges to the center, and doubled along the center.

FOLDED-EDGE: (1) A belt construction wherein the inner carcass is enclosed in an envelope ply or plies. (2) An edge where an outer covering has been wrapped around a carcass and folded over the edge so that the carcass is closed on the edges.

FOLDED ENDLESS: Folded from a fabric strip which has previously been made into an endless sleeve.

FOLDED-FABRIC PACKING: A packing made by creasing and folding a rubberized fabric strip or series of such strips joined end to end.

FOLD-OVER: Where a material is doubled back upon itself, thereby forming a crease.

FOLLOWER: (1) (Stuffing Box)—Same as Gland Follower. (2) (Cup)—Same as Inside Follower.

FOREIGN MATERIAL: Any extraneous matter such as wood, paper, metal, sand, dirt or pigment that should not normally be present in a particular rubber product or composition.

FPM: Abbreviation for "Feet per Minute."

FREE LENGTH: (1) The lineal measurement before subjecting to a load or force. (2) The lineal measurement exclusive of fittings or couplings.

FREEZE RESISTANT: See Cold Resistant.

FRICTION: (1) A rubber adhesive compound applied to and impregnating a fabric, usually by means of a calender with rolls running at different surface speeds, hence the name "friction." The process is called "frictioning." (2) Resistance to motion due to the contact of surfaces. (3) Erroneously used to denote adhesion.

FRICTION COAT: An impregnation of rubber material calendered by friction motion to a fabric so that the material is forced into the weave of the fabric.

FRICTION, COEFFICIENT OF: The ratio between the force pressing the surfaces together and the force required to move it.

FRICTIONED FABRIC: Coated with rubber compound on a friction (uneven speed) calender.

FRICTION, KINETIC: The force which is required to keep a body sliding at a uniform rate. Also called "friction of motion."

FRICTION (PACKING): Force developed by a sliding packing on a moving rigid member, in the direction opposite to the motion. Or the force developed on the packing in the direction of motion. Expressed numerically in lbs. or lbs. per square inch of wear face, or in lbs. per circumferential inch.

FRICTION PULL: See Adhesion.

FRICTION, STATIC: The force which is required to start a body sliding.

FRICTION SURFACE: The exposed portion of a rubber product formed by a layer of rubber-impregnated fabric as distinguished from a product having the fabric completely covered with a layer of rubber.

FROSTING: A very fine surface graying or whitening, usually due to a chemical reaction of the pigment at the surface or to breakdown of the elastomer exposing pigment. It is usually distinguished as different from Bloom since it is not readily removable by solvents. See Chalking and Crocking.

FULL-FACE GASKET: A gasket covering the entire flange surface, and drilled with bolt holes.

FULL THREAD: One complete helical convolution, having at all points a full thread cross section.

FUNGICIDE: A material that prevents or retards the growth of fungi.

FUZZY: A surface showing light particles or fiber linters partially embedded in the surface, usually noted when cured in contact with fabric which is later removed as in wrapped or drum curing.

G

GARTER SPRING: A helical wire spring with ends connected. Used in tension to force the lip of a hat packing or radial seal inwards. Occasionally used in compression.

GASKET: A packing employed in a joint whose members remain in essentially stationary relationship.

GASKETING: Material in bulk form from which gaskets may be cut.

GAUGE: (1) The measure of thickness of the individual elements making up a rubber product. (2) A device for measuring. (See Thickness).

GLAND: (Old meaning)—Same as Stuffing Box. (Newer meaning)—The movable end wall of a stuffing box.

GLAND FOLLOWER: A member protruding into a stuffing box and designed to compress the packing.

GOOSENECK: A hollow device bent to any specified radius, the bending being of such a nature as not to constrict the water-way.

GRAB METHOD: In the physical testing of woven fabrics, the method of determining tensile strength by the use of a piece of fabric much wider than the jaws of the testing machine. The width of fabric tensioned is determined by the width of the jaws, which is usually one inch; the two jaws are set initially 3 inches apart. (ASTM Designation D-39).

GRAIN: The effect on a rubber compound due to processing it through a tubing machine, calender, or mill.

GRAPHITED: Having received an application of graphite.

GRAPHITED-THROUGHOUT: Braided from yarns which have received a prior application of graphite, or, in the case of braid-over-braid construction, an application to each successive braid.

GRAVITY: See Specific Gravity.

GROMMET: A flanged eyelet, used to reinforce a structural opening or protect the member passing through the eyelet.

GROOVE GASKET: A gasket for use in a groove.

GROUND FINISH: Surface produced by grinding or buffing. (See Buffing).

GUM SEAM: Seam made in a ply which has no reinforcement.

GYRATION (SHAFT): Rotation around an axis not coincident with its geometrical axis.

H

HALF-OCTAGON RING: A packing ring of half-octagonal cross section, used like an O-ring.

HANK: A unit of length used in determining yarn number. The number of 840 yard hanks of cotton per pound avoirdupois.

HARDNESS: Property or extent of being hard. Measured by extent of failure of the indentor point of any one of a number of standard hardness testing instruments to penetrate the product.

HARDENING: An increase in hardness, as shown by some penetration test.

HAT PACKING: A sliding packing operating against any inner reciprocating or rotating member of hat-shaped cross section, i. e., with an axially extended inner rim. Less frequently used as a gasket.

HAWSER TWIST: A cord or rope construction in which the first and second twists are in the same direction while the third twist is in the opposite direction, i. e., S-S-Z.

HEAT RESISTANCE: The property or ability of rubber articles to resist the deteriorating effects of elevated temperatures.

HEEL: Base of working face of Cup, Hat, U or V-packing.

HEEL CLEARANCE: Half the difference between heel diameter and the diameter of the working surface against which it operates.

HEEL DIAMETER: (Cup, hat packing, U packing, V packing): Diameter of heel which may be outside (cup), inside (hat packing), or both (U or V packing). If the corner of the packing is curved, heel diameter is the diameter of the line of tangency of the curve to the working face.

HELICAL CORD HOSE: A reinforcement formed of plurality of cords wound in helices around the body of a hose.

HELIX: Shape formed by spiraling a wire or other reinforcement around the cylindrical body of a hose.

HERRINGBONE WRAP: A narrow herringbone woven tape spiralled circumferentially over the outside to apply external pressure during vulcanization. (See Wrapped Cure).

HIGBEE: A thread, whose outermost convolution has been removed to such an extent that a full cross section of the thread is exposed, this exposed end being beveled.

HIGH SPOT: A protrusion above the general surface of an object.

HINGE: Portion of V-ring cross section reduced in area to facilitate flexing of the lips.

HOLLAND SHEETING (CLOTH): A sheeting cloth, to which has been applied a glazed finish by applying an oil and filling material or starch followed by a thorough calendering.

HOMOGENEITY: Uniformity of composition throughout the material.

HOMOGENEOUS: (1) (General)—Of uniform composition throughout. (2) (Compressed asbestos sheet) — Not laminated.

HORSESHOE: A surface fold-over of a definite U-shaped pattern, thus named horseshoe. Particularly used in describing a squeezed out blister in conveyor belt covers. Also called Ring Blisters and Dog Ears.

HOSE CLAMP: A metal collar or strap used to hold hose on to a fitting.

HOSE DUCK: An open-weave duck made from plied yarns with approximately equal strength in warp and filled directions. Used primarily in the manufacture of hose and packings.

HYDRAULIC PACKING: A slab packing composed of superimposed fine cotton friction plies. Used mainly for piston rings. (See Fabric Slab).

HYDRAULIC PRESSURE: A force exerted through fluids.

HYSTERESIS: (1) (General) — Irreversible resistance to displacement. Measured by work lost in a complete cycle of deformation and retraction. (2) (Diaphragm) — Work lost in a complete cycle of deflection and recovery under a varying fluid pressure.

HYSTERESIS LOOP: (1) (General) — Area between stress-strain curves of increasing and reducing stress. A measure of hysteresis. (2) (Diaphragm) — Area between pressure-deflection curves under rising and falling pressures. A measure of diaphragm hysteresis.

I

IMMEDIATE SET: The deformation found by measurement immediately after removal of the load causing the deformation.

IMMERSION: Placing an article into a fluid, generally so it is completely covered.

IMPRESSION, FABRIC: Impression formed during cure by fabric jacket or wrapper.

IMPACT: The single instantaneous stroke or contact of a moving body with another either moving or at rest, such as a large lump of material dropping on a conveyor belt.

IMPREGNATION: To fill the interstices of an article with a rubber compound. Generally applies to treatment of textile fabrics, yarns and cords.

IMPRESSION: (1) Design formed during vulcanization in the surface of any rubber article by a method of transfer, such as fabric impression or molded impression. (2) Printed copy obtained from molded rubber plates or engraved rubber sheet.

IMPRESSION TOP: See Rough Top.

IMPULSE: Application of force in manner to produce sudden strain or motion, such as hydraulic pressure applied in a hose or diaphragm.

INDENTATION: (1) The extent of penetration by the indentor point of any one of a number of standard hardness testing instruments. (2) A recess in any surface of a rubber article.

INHIBIT: To prevent or retard.

INTERNAL EXPANDED COUPLING: A coupling whose shank is expanded after insertion into the hose, forcing the hose out against the restraint of a ferrule or bowl.

INSIDE DEPTH: (1) (Packing ring or set)—Depth of inside periphery. (2) (Cup, hat packing, U packing)—Axial dimension from inside surface of base to plane of lip.

INSIDE FOLLOWER (CUP): A washer employed to compress the base against the adjacent piston face.

INSIDE PACKED: With packing inaccessible from outside, as in a piston packing.

INSIDE WORKING DIAMETER (DIAPHRAGM): Outside diameter of area supported by the piston. Where the piston edge is filleted, it is customary to consider the filleted area as "supported."

INSTANTANEOUS MODULUS: Slope of stress-strain curve at a single point, employed when modulus varies from point to point.

INTERLOCKING BRAID: A solid braid constructed in a special braider with special yarns criss-crossing the section. Generally square.

INTRINSIC VISCOSITY: The ratio of the difference of the viscosity of the solution at the given concentration and the viscosity of the pure solvent to the product of the viscosity of the pure solvent and the volume concentration of the solution. Volume concentration is expressed as:

$$\frac{\text{cc. (solute)}}{\text{100 cc. (solution)}}$$

Intrinsic viscosity is computed on the Benzene soluble portion of the elastomer and is numerically equal to:

$$\frac{2.303 \times \log 10 \times \text{relative viscosity}}{\text{grams of elastomer per 100 M. L. of benzene}}$$

IRON: (1) Process used to dry fabric before impregnating with rubber compound or other processing. (2) Strip of metal used during vulcanization to confine the edge of flat rubber products in a press. (3) A classification of thickness used in shoe products; 1 iron equals 1/48 of an inch.

IRREGULAR: Not uniform.

IZOD IMPACT: A test using a vertical notched rubber specimen supported as a cantilever. The sample is broken by a pendulum blow delivered at a fixed distance from the edge of a clamped specimen. The test requires the notch in the sample to produce a standard degree of stress concentration.

J

JACKET: (1) A seamless tubular braided or woven ply generally exposed on outside. (2) A woven fabric used during vulcanization by the wrapped "cure" method.

JACKET, WOVEN: See Woven Jacket.

JOINT: An interstice between rigid members of a fluid container.

JOINTING (BRITISH): Same as Gasketing.

JOINT (MALE AND FEMALE): A tongue-and-groove joint in which the groove has no inner wall, i. e., is merely a counter-bore.

JUNKET RING: See anti-extrusion ring.

JUNK RING: See anti-extrusion ring.

K

KINKING: A temporary or permanent distortion of a product, induced by winding or doubling upon itself.

KNITTED PLY: Spirally interlaced loops of yarn forming a continuous tubular structure.

KNITTER: A machine capable of forming a fabric by the action of needles engaging threads in such a manner as to cause a sequence of interlaced loops. Spirally interlaced loops forming a continuous tubular structure are commonly used as hose reinforcement.

KNOT: A joining by tying together.

KNURL: A series of small knobs or ridges, usually on the exterior surface of a swivel.

L

LAMINATED: Built up from thinner layers.

LAMINATION: A single thickness of material used in laminating a product to the required thickness before vulcanization. (See also Laminated).

LAMINATED COVER: Cover formed to desired thickness from thinner layers vulcanized together.

LANTERN RING: A rigid ring, generally of H-shaped cross section, located in the interior or at one end of a packing set and communicating with a port or ports in the stuffing box wall or moving member.

LAP: A part that extends over itself or like part, usually by a desired and predetermined amount.

LAP SEAM: A seam made by placing the edge of one piece of material extending flat over the edge of the second piece of material.

LATERAL MISALIGNMENT (PIPE): Vertical distance between axes of pipes to be joined.

LATHE CUT: Cut from sleeve on a lathe.

LAY: The amount of advance of any point in a strand for one complete turn.

LAY, ANGLE OF: See Angle of Lay.

LAY, CABLE: See Cable Lay.

LAYER: A single thickness of rubber between adjacent parts.

LAY, SPIRAL: See Spiral Lay.

LEAD BURST: A leak in lead press hose during vulcanization caused by a burst of the lead covering.

LEAD CHIP MARKS: Minor nicks or marks in the surface of the cover of lead press hose caused by particles of lead (flakes) sloughing off the lead press die during the process of lead covering.

LEAD DENT: Any indentation in the surface of lead press hose caused by denting the lead covering before vulcanization.

LEAD DISCOLORATION: A dark discoloration in the cover of colored lead press hose caused by a chemical reaction of the lead with the rubber compound.

LEAD DIE MARKS: Longitudinal lines or marks in the cover of lead press hose caused by scratches, etc., in the lead press die forming the lead pipe.

LEAD FLAKES: Tiny flakes of lead which remain on the cover of lead press hose after the lead covering has been stripped from the hose.

LEAD PRESS CORRUGATED: A ribbed or corrugated exterior surface obtained by the lead press method.

LEAD PRESS CURE: A process wherein an extruded lead sheath acts as a restraining member or mold during vulcanization.

LEAD PRESS FINISH: The type of exterior surface obtained by the lead press method.

LEAD PRESS JOINT: See Charge Mark.

LEAD PRESS SMOOTH: A smooth exterior surface obtained by the lead press method.

LEAD STOP: See Charge Mark.

LENGTH: A lineal dimension, usually the longer or longest dimension of the product.

LEAKER: (1) A crack or hole in the tube which allows fluids to escape. (2) A hose assembly which allows fluids to escape at the fittings or couplings.

LEGS: Tension filaments appearing when raw cemented or frictioned plies are pulled apart. (Also see Teeth).

LENGTH, RANDOM: See Random Length.

LENGTH TOLERANCE: A specified allowance from a standard or given length.

LENO BREAKER: An open-mesh fabric made from coarse ply yarns, with a leno weave. A leno weave is one in which certain warp threads—termed doup or crossing threads—are passed from side to side of one or more ends —termed standard threads—and are bound in by the filling in this position. Where the crossed interlacing occurs an open, perforated structure is formed.

LIFE TEST: A laboratory procedure used to determine the amount and duration of resistance of a rubber article to a specific set of destructive forces or conditions. (See Accelerated Life Test).

LIFT VALVE: Same as a Poppet Valve.

LIGHT COVER: A cover relatively thin in gauge. (Also see Thin Cover).

LIGHT RESISTANT: Withstands the deleterious action of light, such as cracking.

LIGHT TUBE: A tube relatively thin in gauge. (Also see Thin Tube).

LINEAR EXPANSION: Expansion in any one linear dimension or the average of all linear dimensions.

LINED BOLT HOLES: Bolt holes which have been given a protective coating by the addition of a lining material to cover the internal structure.

LINED HOSE: Fire hose having a seamless woven jacket or jackets and an internal rubber tube.

LINING: (1) A protective rubber sheet. (2) A hose tube.

LIP: (Cup, hat packing, U packing, V packing): An axially extended rim.

LIP DIAMETER: (Cup, hat packing, U packing, V packing): Diameter of tip of lip, which may be outside (cup), inside (hat packing), or both (U or V packing).

LIP GASKET: (1) Any gasket which is self-tightening by virtue of a protruding lip. This includes cups, hat packings, U packings, etc., when used as gaskets. (2) A gasket with lip used for attachment.

LIP-INTERFERENCE: Half the difference between lip diameter and the diameter of the working surface against which it operates.

LIP PACKING: (1) (General)—A cup, hat packing or U packing. (2) (Restricted) A hat packing with a thickened rim.

LIP SEAL: Same as radial seal.

LIP THICKNESS: (Cup, hat packing or U packing): Radial dimension—measured at right angle to lip surface.

LONG HANDLES: A pair of projecting fingers on a coupling long enough for hand-tightening the coupling.

LONGITUDINAL CORD BREAKER: A cord breaker laid in parallel to the edges of the belt.

LONGITUDINAL SEAM: A seam joining two materials in the length of the finished product.

LOOP EDGE: A selvage formed by having the filling loop around a catch cord or wire, which is later withdrawn, leaving small loops along the edge of the cloth.

LOOP-EDGE TAPE: A tape woven with a selvage edge formed by looping the fill threads to prevent raveling, allowing extensibility for even tensions.

LOOSE COVER: Separation of the cover from adjacent fabric or reinforcements.

LOOSE EDGE: The separation of the edge of a fabricated product reinforced with textile or other reinforcements.

LOOSE PLY: Separation between adjacent plies.

LOOSE TUBE: Separation between tube and adjacent structural component.

LOW SPOT: A depression below the general surface of an object.

LOW TEMPERATURE FLEXIBILITY: The ability of a rubber product to be flexed, bent or bowed at low temperatures.

LOW TEMPERATURE FLEXING: Act or instance of repeated bending or bowing a rubber product under conditions of low temperature. (See Cold Flex).

LUBRICANT SEAL: A sealing connection introducing oil or grease as a sealing fluid.

LUBRICATED: Impregnated or surface-treated with some material which is assumed to have a lubricating function on a sliding surface. Often a misnomer since such materials do not function as true lubricants.

LUG: (1) A projection on the outside surface of a coupling, serving to engage a spanner wrench. (2) A projection on the inner surface of a rim to prevent creeping or movement on the rim.

LUG SPRING: Same as Finger Spring.

M

MACHINE MADE: (1) Mandrel-built reinforced hose made by machine as opposed to hose built by hand. (2) Tubing that is processed without internal support.

MANDREL: A form usually of elongated section used to size and support a product during fabrication and/or vulcanization. It may be rigid or flexible.

MANDREL BUILT: A product fabricated and/or vulcanized on a mandrel.

MANDREL WRAPPED: Built up by wrapping thin unvulcanized sheet on a mandrel.

MARCEL SPRING: Same as Wave Spring.

MATCHING: The act of comparing two or more articles for sameness in appearance, dimensions, or color.

MATCHING V-BELTS: Two or more V-belts that have rotational lengths within specified limits.

MAXIMUM DIAMETER: The greatest admissible diameter in a given case.

MEAN DIAMETER: As in a hose, tubing or cylindrical article, the average diameter of the extreme dimensions of the article as a whole or any specific component thereof.

MECHANICAL SEAL: Same as Axial Seal.

METAL-FOIL PACKING: Wide metal foil, treated with a binder, and twisted or wrapped on itself to make a coil, which can be converted to spiral or ring. This type is not often rubberized.

MIGRATION: The transfer of an ingredient in a rubber compound from one layer to an adjacent layer or to the surface.

MIGRATION STAIN: When staining occurs on the area of an object adjacent to the rubber article it is known as "migration stain."

MILDEW: Growth on organic matter produced by fungi, generally in textile components of rubber articles. Usually causes deterioration of the textile.

MILDEWCIDE: See Fungicide.

MILDEW INHIBITED: The article contains material to prevent or retard mildew.

MILDEW INHIBITOR: See Fungicide.

MILDEW RESISTANT: Withstands the action of mildew growths and their deteriorating effect.

MIRROR FINISH: A bright, polished surface.

MISALIGNMENT: Departure from alignment.

MODULUS: (1) A coefficient or numerical measure of some property. (2) In rubber, modulus usually refers to one of several measurements of stiffness or resistance to deformation. The use of the word without modifying terms may be confusing and such use should not be encouraged. Modulus in rubber may be either static or dynamic; static moduli are subdivided into tangent, chord and compounder's. Compounder's modulus is always in tension, but all the others may be in shear, compression or tension. Other terms used in connection with "modulus" are elasticity, rigidity, Young's tangent, elongation (which see). (3) All elastic moduli in rubber (except compounder's) are ratios of stress to the strain produced by that stress, the strain being expressed fractionally, the units of the modulus being the same as those for the stress, usually p.s.i.

MODULUS AT 300% (OR OTHER PER CENT ELONGATION): See Compounder's Modulus.

MODULUS OF ELASTICITY: One of several measurements of stiffness or resistance to deformation, but often incorrectly used to indicate specifically static tension modulus. (See Modulus).

MODULUS OF RIGIDITY: See Shear Modulus.

MOISTURE ABSORPTION: The absorption of moisture by a rubber or textile product.

MOISTURE REGAIN: The reabsorption of moisture in a rubber or textile product.

MOLDED: (1) Cured in a mold. (2) (Not preferred)—Same as Die-Formed.

MOLDED DIAPHRAGM: A diaphragm packing, generally in some contour other than flat, prepared by molding.

MOLD CAVITY: Hollow space or cavity in the mold which is used to impart the desired form to the product being molded.

MOLD FINISH: The uninterrupted surface produced by intimate contact of the rubber with the surface of the mold cavity during vulcanization. (Also see Mold Skin).

MOLD LUBRICANT: The material used to coat the surfaces of a mold to prevent the rubber adhering to the metal during vulcanization.

MOLD MARKS: Indentations or ridges embossed into the skin of the molded product by irregularities in the mold cavity surface.

MOLD REGISTER: Means used to align the parts of a mold.

MOLD RELEASE: See Mold Lubricant.

MOLD SCRATCHES: See Mold Marks.

MOLD SKIN: The surface of a molded product formed by contact with the mold.

MOLD WASH: (1) A preparation used to prevent sticking to molds. (2) The residue left on the molded article.

MONOMER: A simple chemical compound which enters into the production of a polymer.

MOONEY SCORCH: The measurement of the rate at which a rubber compound will precure or set up by means of the Mooney Viscometer.

MOONEY VISCOSITY: The measurement of the plasticity or viscosity of an uncompounded or compounded unvulcanized rubber and rubberlike materials by means of the Mooney Shearing Disk Viscometer. (Reference ASTM D-927).

MORTISE JOINT (PACKING RING): Same as Step Joint.

MULTIPLE CARRIER BRAID: A solid or hollow braid constructed on a maypole braider with more than 8 carriers, giving normally a polygonal cross section.

"M" VALUE: An empirical design constant of a flange gasket used in the ASME Code for Unfired Pressure Vessels. The Code equation defines this term as the ratio of residual gasket load to fluid pressure at leak. The definition of "m" has varied in successive editions of the Code, according to the method employed for computing residual gasket load.

N

NECKING DOWN: The diminution of the cross-sectional area of a rubber product.

NERVE: Usually applied to unvulcanized rubbers or compounds. Refers to degree of toughness or resistance to deformation.

NET ENDLESS LENGTH: The manufactured length necessary to provide adequate service under operating conditions.

NICK: A small notch, slit, or cut.

NIP: The clearance between rolls of a mixing mill or calender. (See Bite).

NIPPLE: A cylindrical pipelike attachment, usually metallic, one end of which is securely inserted and retained in the end of the hose. The inserted end may be plain, or banded, that is, with attached external circumferential bands, or grooved (scored), that is, having circumferential grooves depressed in the external surface.

NOMINAL LENGTH: The desired length from which tolerances are set. (See Length Tolerance).

NON-BLOOMING: The absence of bloom.

NON-FILL: Improperly filled, not completed, containing voids.

NOTCH: (1) A V-shaped indentation or hollow. (2) A nick in the surface of a rubber product. (3) Notched V-Belt, a V-Belt cut or produced with a series of evenly spaced V-shaped indentations in the inner face. (See Cog).

NOZZLE END: An end of hose in which both the inside and outside diameters are reduced.

NUMBER (COTTON YARN): The number of hanks in a pound.

NUMBERED DUCK: A duck similar to Army Duck but made in a limited number of weights which are designated by numbers.

NUT: A perforated block, usually metallic, with an internal thread.

O

OCTAGON RING: A packing ring of octagonal cross section, used like an O-ring.

OFF-CENTER: In any fabricated rubber article where eccentric wall or eccentricity exists. Also cases where inner and outer elements are not of uniform gauge with respect to a center element.

OFF-CENTER PLY: Ply of fabric not evenly spaced between equal gauge covers and/or layers in C.I. or diaphragm packing.

OFF-GAUGE: Not conforming to thickness specified.

OIL PROOF: Not adversely affected by exposure to oil.

OIL RESISTANT: Withstands the deteriorating effect of oil (generally refers to petroleum) on the physical properties.

OIL SEAL: A radial seal designed primarily for the retention of oil in bearings, etc.

OIL SWELL: The change in volume of a rubber article due to absorption of oil.

OPTIMUM CURE: State of vulcanization at which maximum desired property is attained.

OPEN SEAM: Seam where edges do not meet, forming a void.

O-RING: A packing ring of round cross section used alone, or with end rings, in a groove. If used in a groove of proper dimensions, it is self-tightening.

O-RING GASKET: A groove gasket of round cross section.

O-RING STATIC SEAL: See O-ring Gasket.

OUTSIDE DEPTH: Depth of outside periphery.

OUTSIDE PACKED: With packing accessible from outside, as in a rod, plunger or ram packing.

OUTSIDE WORKING DIAMETER: (Diaphragm)—Inside diameter of area supported by rim. Where the inner edge of the rim is filleted, it is customary to consider the filleted edge as "supported."

OVEN: A low pressure hot air chamber used for the purpose of heating, drying, baking or vulcanizing rubber products. (See Aging, Air Oven).

OVER-CURE: A degree of cure greater than the optimum.

OVERWEIGHT: Over in specified weight tolerances.

OXIDATION: The reaction of oxygen on a rubber product, usually detected by a change in the appearance or feel of the surface or by a change in physical properties.

OXYGEN BOMB: A chamber capable of holding oxygen at an elevated pressure which can be heated to an elevated temperature. Used for an accelerated aging test.

OZONE RESISTANT: Withstands the deteriorating effects of ozone (generally cracking).

P

PACK: To control leakage by means of packing.

PACKING: (1) A deformable element employed in a joint to eliminate or minimize leakage. (2) Material in bulk form from which packing may be cut.

PACKING COIL: Packing in coil form from which packing rings may be cut.

PACKING GROOVE: A groove carved in a flange, or in one member of a concentric joint, to accommodate a packing.

PACKING HOOK: A tool similar to a corkscrew for removing packings from a stuffing box.

PACKING RING: A sliding packing generally employed in a stuffing box, alone or as a component of a set.

PACKING SET: A plurality of packing rings designed to fill a stuffing box.

PACKING SPACE: (Packing ring or set)—Radial dimension.

PACKING SPIRAL: Packing in helical form from which packing rings may be cut.

PACKLESS: Employing no packing. Frequently a misnomer as referring to fluid-handling equipment packed with a seal or diaphragm.

PAPER: A fiber mat produced by wet screening. May be subsequently treated with rubber solution or other binder.

PAPER GASKETING: Paper, usually treated, intended for gasketing use.

PEDESTAL RING: An adapter designed to support a U packing in the center.

PEELING: The loosening of a rubber coating or layer from a base material, such as cloth or metal or from another layer of rubber.

PERFORMANCE TEST: Same as Service or Bench Test, not conducted to failure.

PERMANENT SET: (1) Permanent set is the deformation remaining after a specimen has been stressed in tension a prescribed amount for a definite period and released for a definite period. (2) In creep determinations, permanent set is the residual unrecoverable deformation after the load causing the creep has been removed for a substantial and definite period of time.

PERMEABILITY: The quality or condition of allowing passage of liquids or gases through a rubber layer.

PICK: A single filling strand.

PIN HOLE: A small puncture in any surface of a fabricated product.

PICKLESS CORD FABRIC: Cord fabric rubberized directly from cord without weaving, i. e., without weft or filling threads.

PISTON: The inner member of a concentric joint, the members of which reciprocate relative to each other, and which contains the packing.

PISTON PACKING: Packing used on a piston in sliding contact with a cylinder wall.

PISTON RING: A piston packing used alone or in a set.

PIT: A surface depression.

PITCH: The distance from one point on a helix to the corresponding point on the next turn of the helix, measured parallel to the axis. Examples: The pitch of yarn, cord or wire in a braided reinforcement; the pitch of an external wire winding or internal reinforcing wire helix in hose. Pitch is not to be confused with Spacing, which see.

PITCH CIRCUMFERENCE: (1) Circumference of a pulley at the pitch line. See Pitch Line. (2) Same as Pitch Length. (Pitch Length is the preferred term when referring to the length of a belt).

PITCH DIAMETER: The diameter of a pulley taken at the pitch line. (See Pitch Line).

PITCH LENGTH: (1) The length of a belt along the pitch line. Whether or not the measurement is made under tension should be specified. (2) In V-belts, pitch length is the length along the arbitrary pitch line and under prescribed tension.

PITCH LINE: (1) The line in the cross section of a belt where the linear speed in traveling around the pulley is exactly the same as the linear speed in the straight portions of the belt. (2) In V-belt drives, arbitrary pitch line locations have been established which may deviate considerably from the true pitch lines as defined in (1).

PITCH (THREAD): The distance from a point on the thread to a corresponding point on the next thread, measured parallel to the axis.

PITTED TUBE: A condition of surface depressions on the inner lining usually caused by trapped air or lubricant.

PLASTICITY: The degree or rate at which unvulcanized rubber and rubber compounds will flow when subjected to forces of compression, shear or extrusion through a die.

PLASTICIZER: A material which when incorporated in rubber or a polymer will change its hardness, flexibility, processability and plasticity.

PLASTIC PACKING: (1) A coil, spiral or ring packing prepared by extruding a compound consisting of a high percentage of fiber (generally asbestos) together with a binder, and with graphite, mica, metal particles, etc., optional, often encased in a skeleton cotton braid. (2) (less frequently)—A packing made from a non-rubber plastic, such as nylon or Teflon.

PLASTOMETER: (1) An instrument for measuring the plasticity of raw or unvulcanized compounded rubber. (2) An instrument for measuring the penetration of an indentor point into the surface of a vulcanized rubber.

PLATED FINISH: The surface obtained by the deposition of a thin metallic film on the surface of a fitting, electrolytically or by dipping.

PLATE FINISH (SHEET): A smooth surface, the usual result of vulcanization between press plates.

PLIED YARN: A yarn made by twisting together two or more single yarns.

PLUNGER: Same as rod but larger. Normally used as a displacement member in a reciprocating plunger pump.

PLUNGER PACKING: Sliding packing employed in contact with a plunger.

PLY: (1) A layer of rubberized fabric. (2) A layer formed by a single pass through a single deck of a yarn, cord, or wire braiding machine. (3) A layer formed by a single pass through a single head of a yarn, cord, or wire knitting machine. (4) A seamless woven jacket consisting of warp and filler yarns and/or wire. (5) A layer consisting of multiple strands of cord or wire close spaced. (6) A layer formed by winding a single strand of cord or wire close spaced. (7) A single yarn in a composite yarn. (8) Used in processing as a layer of unvulcanized rubber compound.

PLY ADHESION: The force required to separate two adjoining strength reinforcing members in a rubber product.

PLY, BUCKLED: A deformation in a ply distorting it from its normal plane.

PLY SEPARATION: Lack of adhesion between plies.

PLY, TORN: A cut or tear in a ply.

PLY, WRINKLED: See Ply, Buckled.

PLY YARN: A yarn made by twisting together two or more single yarns in one operation.

POCKED COVER: Surface of cover marked with small solid circumscribed elevations or depressions.

POCK MARKS: Uneven blister-like elevations, depressions, or pimpled appearance. (See also Air Check and Blister).

POISSON'S RATIO: The ratio of transverse deformation to the deformation in line with the applied force.

POLISHED FINISH: The smooth mirror-like finish, of a metallic fitting, secured by buffing with suitable polishing preparations.

POROSITY: Quality or state of being porous due to presence of globular structural voids.

POLYMER: A material formed by the joining together of many (poly) individual units (mer) of a monomer.

POPPET VALVE: A valve operating by raising and lowering a disc in relation to a seal.

POROUS TUBE: (1) The physical conditions of a hose tube due to presence of pores. (2) A hose tube that has low resistance to permeation.

PORES: Minute surface openings or globular structural voids.

POWER FACTOR: (1) The cosine of the angle of phase displacement between current and applied voltage. (2) A measure of the energy loss in a material whether this loss is due to leakage or dielectric loss.

PRE-CURE: See Semi-Cure.

PRE-LOAD: Axial load developed against, or by, a flange gasket at the time of initial tightening.

PRESERVATIVE: A substance added to or coated over a product to preserve the product against damage or deterioration.

PRESS COLD ENDS: Ends of press cooled by water so that a semi-cured area at the end of the press length of the product will result enabling that portion to be lapped on the next heat and revulcanized making a complete cure on the lapped portion.

PRESS LAPS: The portion of the previous press length of a product which has been revulcanized in curing the following lengths.

PRESS LENGTH: The length of a product which can be vulcanized at one time in a press, limited to the length measurement of the press.

PRESS MARKS: Irregularities in the surface of a vulcanized product caused by the press ends or by corresponding irregularities in the press surface.

PRESS MOLD: The matrix or cavity in which a rubber product is shaped. Also includes the body containing the cavity which can be removed from the press.

PRESS OVERLAP: See Press Laps.

PRESSURE: A force or thrust applied over the surface as hydraulic pressure to a rubber product. Usually referring to pressure in a hose or against a diaphragm.

PRESSURE FACE (PACKING): End exposed to higher pressure.

PRESSURE FINISH CURE: Vulcanizing process depending solely upon the pressure of the curing medium to exert the necessary external pressure. Commonly used for extrusions or all rubber tubing.

PRESSURE GRADIENT: Manner in which fluid pressure diminishes across wear face.

PRICKER MARKS: The marks due to perforating the cover of the hose cover prior to or after vulcanization.

PRINT BRAND: A brand transferred to or printed on the product after manufacture..

PROPORTIONAL LIMIT: The greatest stress which a material is capable of developing without a deviation from the law of proportionality of stress to strain (Hooke's Law). Thus, some portion of the stress-strain curve from the origin up is a straight line. The term ordinarily is not applicable to rubber, as very little, if any, of the stress-strain curve is a straight line. It is common practice to assume the stress-strain line to be straight for very small deformations.

PROOF PRESSURE TEST: A non-destructive hydraulic pressure test applied to a product to show up possible defects.

PROOF RESILIENCE: The energy required to stretch a piece of rubber from zero elongation to the breaking point. It is expressed in foot pounds of work per cubic inch of the unstretched rubber. Mathematically it is the integral measured in a stress-strain diagram by the area subtended on the strain axis by the stress-strain curve. It approximates tensile product divided by two.

PULLED-DOWN TUBE: See Loose Tube.

PULLEY COVER: See Bottom Cover.

R

RADIAL SEAL: A shaft seal in which the packing member (generally a hat packing) contracts radially on the shaft.

RADIAL STRESS: Stress directed against or by a packing in the radial direction.

RAG WRAP: Multiple layers of thin woven fabric torn to a given width to give plurality of continuous layers applied circumferentially in lengths equal to length of product to apply external pressure during vulcanization.

RAISED CENTER: Conveyor belt cover where the center, in the area of greatest wear, is raised above the edges.

RAM: Same as plunger, but normally used as a displacement member in a reciprocating fluid motor.

RAM PACKING: Sliding packing employed in contact with a valve stem.

RAMP (EXPANSION JOINT): A conical outer layer, reaching its maximum diameter directly over an arch.

RECOVERY: The degree to which a rubber product returns to its normal dimensions or shape after being distorted.

RANDOM LENGTH: A unit of material which does not fall into any current classification for standard length.

RAW EDGE: The uncovered square edge of a belt created by cutting after vulcanization.

RECOVERY (SHEET GASKETING): The per cent decrease in compressed deformation during a specified time interval and at a specified temperature, following release of load, as defined by ASTM D-1147.

REINFORCED COVER: The cover of a fabricated elastomer reinforced with textile or other material. Usually applied to hose and belting.

REINFORCEMENT: (1) The strength members, consisting of fabric, cord, and/or metal, of a rubber product. (2) The non-rubber elements making up a rubber product. (See Carcass). (3) The non-rubber compounding ingredients which impart increased tensile strength or other desirable properties.

RELATIVE HUMIDITY: The ratio of the quantity of water vapor actually present in the atmosphere to the greatest amount possible at the given temperature.

RESIDUAL LOAD: Axial load developed against, or by, a flange gasket at some interval after initial tightening. Is less than pre-load by the amount of combined fluid relief and creep-relaxation.

RESILIENCE: (1) In metals and some other materials, resilience is the amount of energy stored up in a deformed body, and as no loss of energy is contemplated, it is also the amount of energy recoverable when the force producing the deformation is removed. (2) In rubber or rubberlike materials subjected and relieved of stress, resilience is the ratio of energy given up on recovery from deformation to the energy required to produce the deformation. Resilience for rubber is usually expressed in per cent. (See also Dynamic Resilience).

RESISTANCE: The property or ability of matter to withstand the effects of force, pressure, heat or chemical action.

RESISTANT: Having resistance.

RETRACTION: (1) (General)—Decrease in strain following partial or complete elimination of stress. (2) (Flange Gasket)—Partial or complete recovery of initial thickness following lessening of gasket stress.

RETRACTION MODULUS: Slope of retraction curve, i.e., stress release divided by decrease in strain generally expressed as a fraction of initial thickness.

REVERSION: (1) The change which occurs in vulcanized rubber as the result of aging or overcuring in the presence of air or oxygen, usually resulting in a semi-plastic mass. (2) It is the basis of rubber reclaiming processes and is aided by the use of swelling solvents, chemical plasticizers and mechanical disintegration to obtain a workable mass.

REVERSED STEP PLY: A conveyor belt having recessed upper ply or plies toward the edge to provide additional cover gauge under guides and skirt boards. (See Drop Ply).

RHEOLOGICAL PHENOMENA: Pertaining to flow. Those properties of plasticity, elasticity, and viscosity in liquids, solids and plastics.

RIDE-IN: Describes the condition in which the top surface of a V-belt fits below the outer rim of the sheave.

RIDE-OUT: Describes the condition in which the top surface of a V-belt extends above the outer rim of the sheave.

RIND: (1) Radial dimension of a gasket. (2) See Flash.

RING BLISTER: See Horseshoe.

RING GASKET: A flange gasket lying wholly within the ring of bolts.

RINGS: (1) Annular cylinders, made from ductile metal, usually brass, copper, or aluminum. (2) A round cross section gasket of "O" design. (3) See Horseshoe.

ROD: The inner member of a concentric joint, the members of which reciprocate relative to each other, and in which the packing is contained in the outer member. Generally applied to an inner member of small diameter.

ROD PACKING: Sliding packing employed in contact with a rod.

ROLL BACK: See Horseshoe.

ROLL BELTING: Belts made to ordered width but of specified lengths for cutting later into shorter lengths.

ROLLED (PACKING): Constructed from a strip of rolled rubberized fabric.

ROLLED-ENDLESS: Rolled from fabric strip which has previously been made into an endless sleeve.

ROLLED-FABRIC PACKING: A packing made by rolling a rubberized fabric strip or series of such strips joined end to end, generally bias cut, around itself or around a core of some other material.

ROLLED THREAD: A thread formed on tubing by compression with a properly shaped roll, and without the removal of metal.

ROLL-FOLDED: Folded in consecutive folds, starting from one edge.

ROPE (ASBESTOS): Same as wick but generally larger and more tightly twisted.

ROTARY PISTON: A piston arranged to rotate rather than reciprocate.

ROTARY SEAL: (1) Any shaft seal. (2) An axial seal.

ROUGH BORE HOSE: A wire reinforced hose in which the wire is exposed in the bore.

ROUGH COVER: Cover having irregularities, ridges, projections or the like, producing a broken surface, not smooth. (See also Rough Top).

ROUGH EDGE: An edge of belting or packing that is less smooth or regular than commercial practice. Belts cured without side irons are sometimes referred to as rough edge belts.

ROUGH TOP: Cover intentionally made to have irregularities, ridges, or projections to produce a broken surface for greater traction or carrying abilities.

ROUGH TRIM: Removal of superfluous parts by pulling or picking. Usually a small portion of the flash or sprue remains attached to the product.

ROUND-BODY GASKET: See O-Ring Gasket.

ROUND-BODY PACKING RING: See O-Ring.

ROVING (ASBESTOS): An untwisted strand of asbestos fiber as it leaves the carding machine.

RPM: Abbreviation for "revolutions per minute."

RUBBER-BONDED PLASTIC PACKING: A plastic packing in which the binder is a solution of some sort of rubber in a volatile solvent, the solvent being later expelled.

RUBBERIZED: Coated with a rubber compound.

RUNOUT (SHAFT): Same as Gyration. When expressed in inches alone, or accompanied by abbreviation "TIR" (total indicator reading), it refers to twice the radial distance between shaft axis and axis of rotation.

RUSSELL EFFECT: The power, after exposure to light, to produce an image on a photographic plate. The effect is due not to radiation but to the chemical action of hydrogen peroxide which was formed by the reaction caused by the light rays.

S

SAND CAST FINISH: The exterior surface finish of a cast fitting, this surface being that of a casting as it is removed from the mold but with the casting flash removed.

SCARF JOINT: Same as Bevel Joint.

SCORING: A variety of wear in which the working face acquires grooves, axial or circumferential, according to whether the motion is reciprocating or rotary. Also applied to a similar effect on the rigid member.

SCRAPER RING: Same as Wiper Ring.

SCRATCH: Surface blemish, a sharp or ragged mark, on finished item by a scored or scratched mold, matrix, or press platens or the finished product being cut after cure.

SCUFFING: A variety of wear in which the working face is roughened.

SEAL: (1) Same as packing. (2) A packing which is self-tightening, i. e., requires no manual adjustment. (3) A sealing connection, as a water-seal.

SEALING CONNECTION: A connection admitting a sealing fluid to a lantern ring within a set, or to the space between two packings, such as twin axial seals.

SEALING FLUID: A fluid introduced into the interior of a packing set via a lantern ring, or into the space between two packings, at a pressure higher than that of the fluid being packed, so that the sealing fluid leaks through the packing in lieu of the fluid being packed.

SEAM: A line formed by joining material to form a single ply or layer.

SEAM, BIAS: See Bias Seam.

SEAM, BUTT: See Butt Seam.

SEAM, COVER: See Cover Seam.

SEAM, LAP: See Lap Seam.

SEAM, LONGITUDINAL: See Longitudinal Seam.

SEAM, TRANSVERSE: See Transverse Seam.

SEAMING STRIP: Strip of material laid over the seam to act as a binder.

SEAMLESS FOLDED: Folded from a length of rubberized tubular-woven fabric.

SELVAGE EDGE: The lengthwise woven edge of a fabric.

SEMI-CURE: Partially cured. (A term frequently used to designate the first cure of an article that is given more than one cure in its manufacture.

SENSITIVITY: (Diaphragm) — Absence of resistance to displacement by light fluid pressures.

SEPARATOR: A thin ring of stiff material such as sheet metal, Teflon, etc., interposed between adjacent packing rings to permit rings to slide over one another and thereby function independently.

SEPARATOR DIAPHRAGM: A diaphragm between two fluids at substantially the same pressure, and hence under little or no stress.

SERVICE TEST: A test in which the packing is made to operate under service conditions in the actual equipment.

SET: Retention of strain following release of stress. The opposite of retraction.

SHAFT: The inner member of a concentric joint, the members of which rotate relative to each other, and in which the packing is contained in the outer member.

SHAFT PACKING: Sliding packing employed in contact with a shaft.

SHAFT SEAL: A shaft packing designed to be self-tightening.

SHANK: That portion of a coupling which is inserted into the hose end.

SHAPE FACTOR: The ratio of the area of one load face to the combined area of those surfaces free to expand laterally when the rubber is under compression.

SHEAR MODULUS: The ratio of the shear stress to the resulting shear strain (the latter expressed as a fraction of the original thickness of the rubber measured at right angles to the force). Shear modulus may be either static or dynamic.

SHEETER: The special calender employed in the manufacture of compressed asbestos sheet.

SHEET GASKETING: Gasketing in sheet form.

SHELL (RADIAL SEAL): A metal cup in which the packing member is assembled or to which it is vulcanized.

SHIPLAP JOINT: Same as Tangential Stepjoint.

SHOCK LOAD: A stress created by a sudden force.

SHOULDER SEAL: Same as Axial Seal.

SHREDDED METAL PACKING: Narrow strips of metal foil (or flattened wire) dipped in a binder and twisted into a coil, which can be converted to spiral or ring. Binder is usually rubber applied as a solution.

SHRINKAGE: A decrease or contraction in dimension.

SIMULATED SERVICE TEST: Same as Bench Test.

SINGLE ACTING PISTON: A piston with fluid on one side only.

SINGLE FILLING DUCK: A type of flat duck with a single-yarn filling.

SINK BLISTERS: See Sinks.

SINKS: A collapsed blister or bubble leaving a depression in the product.

SKELETON BRAID: A multiple carrier braid of open pattern.

SKIM OR SKIM COAT: A layer of rubber material laid on a fabric but not forced into the weave. Normally laid on a frictioned fabric.

SKIMMED FABRIC: Coated with rubber on a calender. The skim coat may or may not be applied over a friction coat.

SKIVE: A cut made on an angle to the surface to produce a tapered or feathered cut.

SKIVE EDGE: An edge that has been cut with a skive.

SKIVE JOINT: See Bevel Joint.

SLAB: Thick sheet, generally laminated.

SLAB PACKINGS: Coil, spiral or ring packings cut from fabric slab.

SLEEVE: A short tube, generally of large diameter.

SLICK TUBE: Area of low adhesion between tube and adjacent fabric ply or layer evidenced by a glossy surface.

SLIDING-CONTACT PACKING: See Sliding Packing.

SLIDING PACKING: A packing employed in a joint whose members are in relative motion.

SLIDING SEAL: (1) See Sliding Packing. (2) A self-tightening sliding packing.

SLIVER (ASBESTOS): A fluffy assemblage of asbestos fibers, generally ½-inch diameter or larger taken from a carding machine with no twist or a very slight twist.

SLOTTED: A type of coupling having equally spaced axial slots on the external surface of the coupling; these slots replace lugs or handles, and serve as the application point of a hook spanner.

SMOOTH BORE HOSE: A wire reinforced hose in which the wire is not exposed in the bore.

SMOOTH COVER: Cover made to have an even and uninterrupted surface of commercial finish.

SMOOTH TOP (BELT): The cover of a belt made to have an even and uninterrupted surface. Produced by vulcanizing against an even surface such as a press platen of commercial finish.

SOFT END: An end in which the rigid reinforcement of the body, usually wire, is omitted.

SOFTNESS: Lack of resistance to penetration. Opposite of Hardness.

SOLID (PACKING RING): Endless.

SPACER: (1) A rigid unattached ring in a packing set serving to prevent excessive deformation of adjacent soft rings. (2) A rigid unattached ring between two piston packings, for instance, two cups back to back.

SPACING: In wire windings in hose (either external or internal) the space between adjacent turns of the wire. Differs from "pitch" in that the diameter or width of wire is not included.

SPECIFIC GRAVITY: The ratio of the weight of a given substance to the weight of an equal volume of water at a specified temperature.

SPIDER MARK: (1) A cleavage caused by failure of compound to reunite after passing the spoke of the spider in an extrusion machine. (2) Grain produced at point of joining of stock after passing spoke of the spider.

SPIRAL LAY: The manner in which a spiral reinforcement is applied with respect to angularity and lead or pitch as in a hose or cylindrical article. (See Angle of Lay).

SPLICED (GASKET OR RING): Made from a length of extruded coil by joining the ends, either before vulcanization or after.

SPRAY OIL: An oil sprayed onto asbestos fiber before carding; hence, contained in the resultant yarn or fabric.

SPREAD: A thin coat of material applied in solvent form dispersed or expanded over the surface by means of knife, bar or doctor blade.

SPREAD FABRIC: Coated with rubber compound by knifing a rubber solution on the surface and drying.

SPRING SPREADER: A finger spring employed to spread the lips of a U packing, hat packing or cup.

SPRUE MARKS: Marks left on the surface of a rubber part, usually elevated, after removal of the sprue of an injection or transfer mold.

SQUARE BRAID: (1) Any braid of square cross section. (2) An 8-carrier braid.

SQUARE EDGE: Edge of rubber-covered belting cured against irons which give a square edge to the belt. (Also see Raw Edge).

SQUARE WOVEN: A cloth or duck having practically the same count or tensile in both the warp and fill.

STACK DEPTH: Same as Working Depth, generally applied to V-rings or cones.

STACK HEIGHT: Same as Stack Depth.

STAINING: The discoloration imparted to the surface finishes in contact with a rubber product.

STAMP BRAND: See Print Brand.

STATIC: Electrical potential charge produced on surface through motion or rubbing rubber against unlike materials.

STATIC BONDING: Grounding of static eliminating or conducting member.

STATIC CONDUCTING: Quality or power of conducting or transmitting electrical static charge. (See Conductivity).

STATIC ELIMINATION: A means for preventing an electrical potential charge or means of dissipating same.

STATIC FREE: Devoid of static.

STATIC MODULUS: The ratio of stress to strain under static conditions. It is calculated from static stress-strain tests, in shear, compression or tension, and is expressed in p.s.i. unit strain.

STATIC PROOF: See Static Conducting.

STATIC SEAL: (General)—Same as Gasket. (Restricted)—A self-tightening gasket.

STATIC WIRE: A wire incorporated in a rubber product to give the quality or additional power to conducting or transmitting static electricity.

STEP JOINT: (Packing ring)—A Z-shaped cut starting as a butt joint in one face and finishing as a butt joint in the other face at a point not opposite.

STEP PLY: A conveyor belt having a plied textile carcass in which the upper ply or plies are set back toward the edges to increase the cover gauge in loading area.

STITCHED BELT: (1) A belt made from plies of non-rubberized fabric sewed together to make a unit structure. (2) A rubberized belt in which the plies have been sewed.

STITCHED CARCASS: The body of a product excluding its covers and which has been sewed.

STITCHING: (1) A method of butting or joining two pieces of material together usually by means of a stitcher roller. (2) Sewing.

STRAIGHT END: An end with inside diameter the same as that of the main body.

STRAIGHT WRAP: A rag wrap applied with the warp of the wrapper parallel to the axis of the hose.

STRESS (PACKING): Compressive unit load (pounds per square inch) directed against packing by adjacent rigid member, or by the packing against the rigid member.

STRESS DECAY: See Creep-Relaxation.

STRETCH: (1) An increase or elongation in dimension. (2) Stress given to belting and fire hose during vulcanization to reduce elongation.

STRIATED COVER: Drawn or pinched lines, generally in the direction of the cover, due to drawing or transfer of irregularities from contact with external curing or forming equipment.

STRIP GASKETING: Gasketing in strip form.

STRIP METHOD: In fabric testing, a tensile strength test made on a strip of fabric ravelled down to a specified number of threads or width of fabric, all of which are firmly held in grips wider than the test piece. (ASTM Designation D-39).

STRIP PACKING: Same as Strip Gasketing.

STRIPPER CUTS: Longitudinal cuts in the cover of lead press hose caused by an improper setting of the stripper knife used in cutting the lead covering off lead press hose.

STUFFING BOX: A groove or counterbore to accommodate a gasket or a ring set and provided with a gland follower.

STUFFING BOX GASKET: A gasket for use in a stuffing box.

SUB PERMANENT SET: Strain retained at the end of a finite interval following release of stress.

SUN CHECKING: Surface cracks, checks, or crazing caused by exposure to direct or indirect sunlight. (See Ozone Cracking).

SUPPORT RING: See Adapter.

SURFACE-GRAPHITED: Graphited on surface only.

SURFACE RESISTIVITY: The electrical resistance of a unit of surface area to a steady current.

SURFACE SPEED: Translational speed of moving member measured at packing interface. Expressed in feet per minute.

SURFACE VOID: A void on the surface of a product. (See Voids).

SWELLING: Increase in volume, usually caused by immersion in a liquid.

SWIVEL: The free turning threaded portion of a coupling.

SWIVEL JOINT: A concentric joint between members in limited rotary motion.

SWING JOINT: Same as Swivel Joint.

T

TABBY: Pick yarns or cords closely woven into strips in woven cord, enabling the woven cord to be cut without the individual cords in the rest of the roll becoming displaced.

TACK: See Tackiness.

TACKINESS: The property of being tacky.

TACKY (RUBBER SURFACE): Tending to adhere.

TANGENT MODULUS: In rubber where the static stress-strain line usually is not straight, the slope of the line at any point expressed in p.s.i. per unit strain represents the tangent modulus at that point in shear, extension or compression as the case may be.

TANGENTIAL JOINT: (Packing ring): A cut along a plane parallel to the axis and approximately tangent to the inside periphery.

TANGENTIAL STEP-JOINT: (Packing ring) — A Z-shaped cut starting as a butt joint on the inside periphery and finishing as a butt joint in the outer periphery at a point not opposite.

TAPERED END: An end with a progressively reducing dimension.

TEAR: To separate or pull apart by force. In measuring tear resistance of rubber, the specimen is usually nicked with a sharp blade and then the force to tear the rubber is measured.

TEAR RESISTANCE: The property of a rubber article to resist tearing forces.

TEETH: The tension filaments which appear between two adhering plies of rubber as they are pulled apart.

TELL-TALE CONNECTION: A bleed connection primarily to indicate packing failure.

TEMPERATURE: The degree of heat or cold as measured in terms of degrees Centigrade or Fahrenheit.

TEMPLATE: (1) A gauge or pattern used as a guide for cutting or finishing. (2) A gauge for measuring purposes, such as "go—no-go" template.

TENSION, EFFECTIVE: In a belt drive, the difference between the two tensions in a belt as it approaches and leaves a driving or driven pulley. In a two-pulley drive, it is the difference between tight and slack side tensions.

TENSION, MAXIMUM: (1) The highest tension occurring in any portion of a belt drive. In a two-pulley drive it is the tight side tension. (2) In conveyors, the maximum tension may occur at a point other than the drive pulley.

TENSION MODULUS: The ratio of the tension stress to the resulting tension strain (the latter expressed as a fraction of the original length). Tension modulus may be either static or dynamic.

TENSION, SLOPE: (1) The tension in a belt caused by weight independent of friction or other forces. (2) "Belt Slope Tension," the tension caused by the weight of the belt, independent of friction or other forces. (3) "Load Slope Tension," the tension caused by the load on the belt, independent of friction or other forces.

TENSION RATIO: In a belt drive, tension ratio is the ratio of the larger to the smaller tension as the belt approaches and leaves a driving or a driven pulley. In each case the centrifugal tension is deducted before calculating the ratio.

TENSION, SLACK SIDE: In a belt drive, where the two portions of the length of the belt on either side of a driving or driven pulley have different tensions, the slack side tension is the smaller of the two. Slack side tension includes centrifugal tension unless otherwise specifically stated.

TENSION, TIGHT SIDE: In a belt drive, where the two portions of the length of the belt on either side of a driving or driven pulley have different tensions, the tight side tension is the larger. Tight side tension includes the centrifugal tension unless otherwise specifically stated.

THERMAL CONTRACTION: Contraction caused by decrease in temperature.

THERMAL EXPANSION: Expansion caused by increase in temperature. May be linear or volumetric.

THICKNESS: (1) The measure of thickness of the complete rubber product. (2) See Gauge. (3) Gasket or gasketing from which gasket will be cut—axial direction. (4) For packing rings or sets the term "depth" is preferred.

THIN COVER: A cover the thickness of which is less than specified.

THIN TUBE: An inner lining the thickness of which is less than specified.

THREAD: A ridge of uniform section in the form of a helix, on the external or internal surface of a cylinder, or in the form of a conical spiral on the external or internal surface of a cone.

TIE CLOTH BREAKER: A leno, cider cloth or cord breaker inserted between the belt cover and strength member.

TIGHT BRAID: (1) An unevenness in the braid reinforcement caused by one or more ends of the reinforcement being applied at a greater tension than the balance of the ends of the braided reinforcement. (2) Also refers to a localized necking down of the braided reinforcement caused by a braider stop or some other such cause.

TONGUE: An axial extension of one flange joint, partly penetrating a groove in the opposite flange.

TONGUE-AND-GROOVE JOINT: A flange joint in which one flange is provided with a tongue and the other with a groove.

TOP COVER: The protective rubber cover on the material conveying surface or surfaces of a conveyor belt. (See Bucket Cover).

TORQUE (PACKING): Moment of rotational friction, i. e., friction times radius of wear face. Expressed in pound-inches total, or per square inch of wear face, or per circumferential inch.

TORQUE MODULUS: Same as Instantaneous Modulus.

TORSION: (1) Deformation by twisting. (2) The internal restoring couple or twisting moment in a piece of rubber subjected to a twisting motion.

TORSIONAL VIBRATION: A periodic rotational vibration about an axis.

TRACTION TOP: See Rough Top.

TRANSFER SEAM: A seam joining two materials at 90° to the length of the finished product.

TRANSVERSE BREAKER: See Transverse Cord Breaker.

TRANSVERSE CORD BREAKER: A cord breaker laid in at right angles to the edges of the belt.

TRANSVERSE SEAM: A seam joining two materials across the width of the finished product.

TRAPPED AIR: Air which is trapped in a product or in a mold during cure. Usually causes a loose ply or cover, or a surface mark, depression or void.

TRIM: The removal of superfluous parts from a molded product. Usually removal of parting line flash or feed sprues.

TRIM CUT: Damage to mold skin or finish by too close trimming.

TRI-MER: A polymer whose molecule is believed to consist of three molecules of the monomer.

TRIMMING: Act of removing superfluous parts from a product.

TROUGHED DIAPHRAGM: A molded diaphragm in which an annular area is depressed below the planes of both rim and center. Designed to permit longer travel than a flat diaphragm of same diameter.

TUBE: The innermost continuous all-rubber element of a hose.

TUBE SHEET FERRULE: A gasket contained in a stuffing box surrounding a tube where it passes through a tube sheet.

TUBE SHEET GASKET: A flange gasket in which one flange is the face of a tube sheet.

TUBULAR GASKET: A gasket, generally of round cross-section, with a hollow center.

TWIST: (1) The turns about its axis, per unit of length, observed in a fiber, roving, yarn, cord, etc. Twist is usually expressed as turns per inch. (2) The turn about its axis of a hose subjected to internal pressure.

U

ULTIMATE ELONGATION: Elongation at rupture.

UNDER-CURE: A degree of cure less than the optimum. (See Cure).

UNDER GAUGE: Thinner than the thickness specified.

UNDERWEIGHT: Under specified weight tolerances.

U PACKING: A sliding packing, operating against any inner or outer reciprocating or rotating member, of a U-shaped cross section, i. e., with both inner and outer rims axially extended. Less frequently used as a gasket.

UPSET END: See Flanged End.

V

VALVE: A device for controlling shutting off or diverting the flow of fluid.

VALVE DISC: A deformable disc or disc facing, on a poppet valve.

VALVE SEAT: A deformable seat facing, on a poppet valve.

VALVE STEM: A rod or shaft employed to manipulate a valve of any type from a point outside the fluid container.

VALVE STEM PACKING: Sliding packing employed in contact with a valve stem.

VANNER EDGE (BELT): Raised sections on the edges of a rubber belt to prevent loss of material being conveyed.

VAPOR CURE: A process for vulcanizing rubber without sulfur inclusion by subjecting the article to the action of sulfur chloride or other curing agents in a closed chamber. It is used generally for thin walled articles.

VIBRATIONAL RESILIENCE: See Dynamic Resilience.

VISCOSITY: A manifestation of internal friction opposed to mobility. The property of fluids and plastic solids by which they resist an instantaneous change of shape, i. e., resistance to flow.

VOIDS: The absence of material or an area devoid of materials where not intended. (See also Blisters, Bubbles, Sinks).

VOLUME COMPRESSIBILITY: Reduction in physical size effected by imposing a load.

VOLUME EXPANSION: Expansion in volume.

VOLUME SWELL: Increase in physical size caused by the swelling action of a liquid.

V-PACKING: A sliding packing of V cross section, operating against any inner or outer reciprocating or rotating member. Used alone or in sets.

V-RING: See V-packing.

VULCANIZATION: Act or process of treating an elastomer or compound of same to improve its useful properties, usually accomplished by application of heat.

VULCANIZE: The act of vulcanization. (See Vulcanization).

W

WARP: (1) The yarns that run lengthwise in a woven fabric or jacket. (2) The total deviation from a straight line of a hose when subjected to internal pressure.

WARP-YARN: (1) A longitudinal yarn in a fabric. (2) A corner yarn in a braid.

WATER ABSORPTION: The process of assimilating or soaking up water.

WATER HAMMER: The concussion or sound of concussion of moving liquid against the sides of a containing pipe or vessel on a sudden stoppage of flow. The most common concussion is that generated by the sudden closure of a valve in a pipe containing a flowing liquid.

WATER OF HYDRATION: The water of composition contained in asbestos.

WATER RESISTANT: Withstands the deteriorating effect of water absorption.

WATER SEAL: A sealing connection introducing water as a sealing fluid.

WATERWAY: The unrestricted axial orifice through which passes the material to be conducted. (See Bore).

WAVE SPRING: A ribbon of tempered steel bent into waves. Thrust may be radial or axial.

WAVY TUBE: Inner surface of tube showing peaks and valleys as a result of tube showing the braid pattern.

WEAK SPOT: A limited structural defect in a product which degrades the physical characteristics or strength.

WEAR (SLIDING PACKING): Loss of material from working face.

WASHER: (1) An annular disc, usually made of an elastomeric material. (See Gasket). (2) Occasionally same as Valve Disc, as in "bib-washer."

WEAVE (RECIPROCATING MEMBER): Radial displacement during stroke, due to being bent or improperly guided.

WEFT: The crosswise threads in a fabric; filling threads. The threads or yarns running at right angle to the warp.

WEFTLESS CORD FABRIC: See Pickless Cord Fabric.

WETTING: To form a continuous film of a liquid on a surface.

WHIP: Same as Gyration.

WICK: A plied roving which may or may not be treated with sizing.

WIDTH: (Gasket or gasketing from which gasket will be cut)—Radial dimension. For packing rings or sets the term "packing space" is preferred.

WIPER RING: A ring employed to remove excess fluid, mud, etc., from a reciprocating member before it reaches the packing.

WIRE BRAID: A ply of braided wire reinforcement.

WIRE-INSERTED ASBESTOS YARN: Asbestos yarn which has been plied up with one or more metal wires—generally .008-inch brass or copper—for added strength.

WIRE LOOPED: A loop in the wire reinforcements due to uneven tensions during braiding resulting in a bunching of the wire between areas of higher tension.

WIRE REINFORCED: A product containing metal wires to give added strength, increased dimensional stability or crush resistance. (See Reinforcement).

WIRE THROW-OUT: (1) A broken end or ends in the wire reinforcements protruding from the surface of the braid. (2) A displaced core in rough bore hose.

WIRE WINDING: A single wire or a plurality of wires spiralled in one or more layers as a protective or reinforcing member.

WIRE WOUND: A product with a single wire or a plurality of wires spiralled in one or more layers as a protective or reinforcing member.

WIRE WOVEN: Woven with the wire reinforcement applied helically by means of a circular loom.

WOBBLE: An irregular staggering motion from one side to the other.

WORKING DEPTH: Depth of working face, which may be either inside depth or outside depth.

WORKING DIAMETER (DIAPHRAGM): One diameter of the unsupported area.

WOVEN JACKET: A seamless jacket with continuous parallel warp yarns interlaced spirally with continuous filler elements.

W-PACKING: A sliding packing of W cross section operating against any inner or outer reciprocating or rotating member. Used alone or in sets.

WRAP: See Rag Wrap, Cross Wrap and Straight Wrap.

WRAPPED CURE: Vulcanizing process using a tensioned wrapper (usually fabric) to apply external pressure.

WRAPPER: See Rag Wrap, Cross Wrap and Straight Wrap.

WRAPPER MARKS: Impressions left on the surface by the material used to wrap the product during vulcanization. Usually shows characteristics of a woven pattern and wrapper width edge marks. (See Wrapped Cure).

W-RING: See W-Packing.

WRINKLE: A corrugation, ridge, crease or fold in the reinforcement member or the tube or covers.

WRINKLED COVER: See Wrinkle.

Y

YARN: A generic term for continuous strands of textile fibers or filaments in a form suitable for knitting, weaving, or otherwise intertwining to form a textile fabric. It may comprise: (a) a number of fibers twisted together, (b) a number of filaments laid together without twist (a zero-twist yarn), (c) a number of filaments laid together with more or less twist, or (d) a single filament with or without twist (a mono-filament).

YIELD POINT: The stress in a material, at which there occurs a marked increase in strain without an increase in stress. Rubber is said to have a zero yield point except under very rapid elongation and release.

YIELD STRENGTH: The stress at which a material exhibits a specified limiting permanent set. Determined by a measurable value of plastic yielding of the material above which the material is considered to be damaged and below which the damaging effects are considered to be negligible.

YOUNG'S MODULUS OF ELASTICITY: (1) In many non-rubber materials, Young's Modulus may be taken in tension or compression, the values being approximately the same. It is the ratio of stress to strain, expressed in p.s.i. per unit strain. (2) In rubber, the assumption that tension modulus equals compression modulus is valid only for extremely small deformations and for certain shapes, such as specified in ASTM D797 "Standard Method of Test for Young's Modulus in Flexure of Natural and Synthetic Elastomers" and ASTM D1053 (Sec. 7) "Measuring Low-Temperature Stiffening by the Gehman Torsional Apparatus."

"y" VALUE: An empirical design constant of a flange gasket used in the ASME Code for Unfired Pressure Vessels. The Code defines the term as twice the minimum gasket pre-stress, but the method of arriving at this value is not clearly stated.

Z

ZERO LOAD: A minor load applied to sheet material in the course of getting initial thickness reading and prior to determining compressibility.

Four Measures for Properly Guarding Conveyors

ACCIDENTS concerned with the operation of conveyors in rubber factories frequently assume serious proportions. For example, one company reported the following accidents during the calendar year of 1952:

(a) Employee caught right arm between loading-conveyor belt and automatic Banbury door. He was trying to get slab of rubber that was under belt. The Banbury timed out and automatic Banbury door shut, catching his arm between the belt and door.

(b) Employee was on roof where he opened conveyor chute. As he tried to remove a piece of board from screw conveyor he caught his hand in the screw.

(c) While crossing conveyor, employee caught his foot btween idle roller and belt at conveyor junction point.

(d) When attempting to recover a strip of bead filler which had run off the east side of the conveyor belt, employee slipped. His left arm was caught between belt and pulley.

These accidents show the importance of properly guarding conveyors. Four preventive measures that should be taken with reference to conveyors, advanced by the Rubber Section of the National Safety Council, are as follows:

(1) All bites created by conveyor belts going around pulleys should be enclosed with guards if the bites are at all accessible from the floor or a platform. This recommendation particularly applies to belt conveyors at mills, tubers, and tread tubers.

(2) Junction points between two sections of a belt conveyor can result in a serious foot accident when such conveyors are at floor level, such as in tire-building departments. Enclosing this space with a solid plate or a plate with built-in rollers or providing any other effective means of eliminating or reducing the hazard is most important.

(3) Employees should not be permitted to walk on or over conveyors.

(4) Emergency stop safety cables should be provided along conveyors at all points.

Editorials . . .

Singapore Conference

A MEETING of direct interest to every member of the rubber manufacturing industry will take place in Singapore on April 22. At this meeting a 16-man delegation from the United States will face producing, packing and shipping interests to exchange direct views at the supplier-consumer level on major problems. As the Rubber Manufactruers Association points out, the meeting is something of a milestone, since it is the first of its kind in the 122-year history of the American rubber manufacturing industry. Similar meetings have been proposed off and on over the past fifty years, but this one has finally crystallized.

The Singapore gathering will be more than just another meeting. It will actually be a business conference and, as such, it will be distinctly different from the international conversations on rubber which have been undertaken over the past 20 years under government or quasi-government sponsorship. As a matter of fact, it will precede by less than two weeks the meeting of the International Rubber Study Group which will be held in Colombo, Ceylon, on May 3. Among the delegates scheduled to attend, in addition to the group from the United States, are those representing producing, packing and shipping interests from Malaya, England, Indonesia, India, and Indo-China.

In a sense the forthcoming meeting at Singapore is an outgrowth of the Crude Rubber Seminars conducted last year by the Rubber Manufacturers Association. Although most manufacturers and dealers take the position that only in the United States would it be possible for producers, packers and shippers to view the quality, packing and condition factors which are the basis of U. S. claims, they seized on the opportunity for an exploratory meeting in the Far East after major interests in that area expressed a preference for Singapore. Since the majority of the delegates are located in the Far East, it seems reasonable to hold the initial meeting in that section.

The Singapore conference will open the ground to a free and direct exchange of ideas between consumer and supplier groups, which should prove most helpful in engendering good-will and understanding. There are always two sides to every story, and nothing brings quicker results than a meeting at which both sides are permitted to stress their own particular problems. It would be a serious mistake if a second meeting is not arranged in the near future for New York or Washington. We are reasonably sure that such a mistake will not be made.

Randall Report

ACCORDING to reliable reports, rubber - producing interests in Malaya are planning to renew their case for an international buffer stock of rubber at the meeting of the International Rubber Study Group to be held at Colombo, Ceylon, starting on May 3. These reports indicate that a high level conference was recently held at Kuala Lumpur and that the conclusion was reached "that a buffer stock was the only hope of the industry." Although in complete sympathy with the problems besetting rubber producers in the Far East because of the present 20 cents-a-pound level for natural rubber, we are afraid that further efforts on the buffer stock are doomed to failure.

The recent report of the Randall Commission, appointed by President Eisenhower to review foreign industrial relations, has received wide acclaim by leading members of the U. S. Congress. A distinct stamp of disapproval on buffer stocks in general was indicated by the Commission. Its report stated that extensive resort to commodity agreements will not solve the problem of price instability and further that such agreements introduce restraints "that impair the elasticity of economic adjustment and the freedom of individual initiative, which are fundamental to economic progress." A hostile Congress is not easily swayed, and rubber producers will have to look for some means of price stabilization other than a buffer stock arrangement.

Revised Statistics

WITH this issue we have completely revised the tables which comprise the section on statistics of interest to the rubber industry. We have added a new table on natural and synthetic rubber latices as well as several tables on world production and consumption of both natural and synthetic rubber. Almost all the other tables have been extensively revised so as to provide the most complete statistical coverage. This is just another indication of our effort to improve the value of our journal to the overall rubber industry. Comments on the new Statistical Section, or any other section, will be welcomed.

NEWS OF THE MONTH

SYNTHETIC RUBBER OUTPUT LAGS ACCORDING TO RECENTLY ANNOUNCED ESTIMATES BY RFC

THE close relationship between natural and synthetic rubber, at the price level, was never more clearly emphasized than in the happenings of the past few weeks, according to advices from the trade and government officials. As it happens, the price of natural rubber, at the moment, is lower than the price for synthetic. This has resulted in a swing by the rubber industry to natural rubber. Accordingly, the government now predicts the worst second quarter for synthetic rubber since before the Korean conflict. According to Kenton R. Cravens, Administrator of the Reconstruction Finance Corporation, nearly half of the new rubber used by American rubber manufacturers is now natural rubber, a jump of over 10% from the proportion of natural to synthetic which existed as recently as December, 1953.

According to the budget presented to the Congress by President Eisenhower last December, total synthetic production for fiscal 1954 was estimated at 608,900 long tons, including about 75,000 long tons of Butyl rubber. The revised estimates by RFC, however, show total synthetic production in fiscal 1954 at about 604,000 long tons, including the 75,000 tons of Butyl.

Mr. Cravens' production estimate for GR-S in fiscal 1954 is 529,000 long tons. As for calendar 1954, his production estimates for GR-S are 126,316 long tons in the first quarter, and 113,250 in the second quarter. Sales of GR-S for the same periods are estimated at 118,200 for the first quarter, with 38,500 long tons to be sold in April and 37,000 long tons in May. No estimates were made for sales in June.

Present estimates of sales run around 37,500 long tons a month. This may be roughly compared with consumption figures set last year which set records at 61,400 long tons in March and 60,546 in April. Mr. Cravens' figures show RFC sales dropping below 40,000 long tons a month for the first time since 1951. However, sales are still far above the low 1949 average of 24,000 long tons a month, when competing natural rubber prices hit bottom and swayed the market.

Mr. Cravens also estimated production in the first six months of calendar 1954, and these figures break down in this manner: January, 43,426 long tons; February, 40,250; March, 42,640; April, 37,250; May, 39,000, and June, 37,000.

Inroad of Oil-Extended Rubber

Other interesting figures have come out of Washington in the past few weeks, showing the inroads which the oil-extended rubbers have been making in the industry. The impressiveness of the gain may be measured by the fact that in 1953 usage of the oil-masterbatch rubbers increased 300%. Tire companies are reported to have purchased 108,054 long tons of this type of rubber last year, due, no doubt, to its price, which is lower than that for straight-run cold rubber.

So far, 95% of the material has gone into tires and tire retreading stock. Most of the remainder is being used in rubber footwear soling. This is partly because the handling of the oil-extended rubbers is somewhat more difficult than natural rubber or the older "hot" synthetic rubber.

With RFC slated to produce only some 530,000 long tons of general purpose synthetic rubber, including both "hot" and "cold," until mid-1955, no plans have as yet been announced to increase the present annual capacity of 240,000 long tons of oil-extended synthetic. RFC would seem to be continuing the policy of producing one pound of the oil-extended rubber to every three pounds or more of conventional "cold" and "hot" rubbers.

According to government officials, RFC has gone as far as it has with the oil-extended rubbers primarily as a defense measure, although it does not overlook the competition these rubbers bring to bear upon the natural product.

It is expected, in some quarters, that the eventual sale of the synthetic rubber producing facilities will mean a somewhat higher price for synthetic rubber, generally. If this is so, added impetus will be given to the lower-cost oil-extended rubbers. For example, the basic price of straight-run cold rubber is presently 23c a pound. Oil-extended rubbers, however, at a 25:100 ratio sell for 19.5c a pound, and at a 37.5:100 ratio, the price is 17.5c.

Speaking of eventual disposal of the synthetic facilities, the Seiberling Rubber Co. recently announced that it expects to join with other rubber firms in bidding on one of the plants to be sold by the government. The amount of the bid has not as yet been set, the company stated.

Secretary Benson and Guayule

Early in February, Secretary of Agriculture Ezra Benson, at a press conference, stated that now is the time to expand planting of guayule in the United States. Secretary Benson was discussing the problem of making use of 20,000,000 acres diverted from wheat, cotton and corn in this surplus year. The Agriculture Department, he said, is looking for all possible means of planting this land. He said the Department is stressing the question of new plants, particularly the "new rubber-bearing plants."

A spokesman at the Office of Rubber Investigations of the Bureau of Plant Industry thought that this was a fine idea, but that the matter should be checked against the budget. Listed under "Research on Strategic and Critical Agricultural Materials," the sum allotted to rubber experiments was $200,032 for fiscal 1953, $108,000 for fiscal 1954, and zero for fiscal 1955.

The Bureau of Plant Industry reports it takes five years to grow an experimental guayule crop. The Bureau feels it is important work, worthy of being continued. At present, 100 acres are being studied. A Bureau spokesman stated that there is no emergency need for expanding guayule, "but we think in five or ten years we should have a crop 50 or 100% better than today's guayule."

Latin American Production

Still other news coming from Washington within the past few weeks had to do with the future of Latin-American rubber as a possible "living stockpile" for the defense of the United States. Top officials of the "Big Four" met with representatives of four different government agencies to discuss this problem.

The Foreign Operations Administration (FOA) currently financing the $600,000 program with Agriculture Department manpower, says it must cut its contribution in half. Only FOA funds matched by the eight Latin American nations partici-

pating in the program will continue to be available.

The object of the program is to develop a high-yield rubber tree that can survive the Latin American leaf blight disease. Office of Defense Mobilization and Commerce Department rubber experts argued in favor of continuing the program with strong backing from industry representatives. Goodyear, with plantations in Costa Rica, and Firestone, with experiments in Guatamala, have favored a research program. Rubber grower spokesmen from Malaya and Indonesia also have indicated interest in developing blight-resistant trees. If the Latin American blight was ever dropped into Asia plantations by plane, the damage would cause a grave international rubber shortage, one top government expert pointed out.

P. W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., coined the term "living stockpile" to describe the program in Latin America. A $600,000 research program compares with the $20,000,000 a year now spent to warehouse and rotate the U. S. natural rubber stockpile imported from the Far East.

The inter-agency meeting concluded with government representatives promising to confer with budget authorities on possibilities of continuing the program.

Industry representatives at the meeting included E. A. Stevens and Paul Wagner (Goodrich), Leland Spencer and C. H. Baker (Goodyear), and B. H. Larabee (Firestone).

Ceylon Reports on Crepe

According to reports from Colombo, Ceylon, the crepe rubber industry is practically doomed and producers have decided to switch over to sheet rubber owing to the uneconomic world price for crepe. Producers complain that the government has paid no heed to requests for assistance, with the result that they have been forced to switch to sheet rubber.

The world price for crepe, now averaging about 18c per sheet, is not expected to increase as the London market is heavily stocked and disposal is difficult.

Although Ceylon has an agreement with Communist China to supply 50,000 tons of sheet rubber this year, it is estimated that if all crepe producers switch to sheet rubber, there will be an overproduction by July and stocks will be far in excess of what is required to fulfill the Chinese order. In such event, the prices are expected to be adversely affected, with small producers likely to be forced out of business.

German Synthetic Rubber

According to recent reports from West Germany, the Huels Chemical Works, a former member of the I. G. Farben industrial group, is now negotiating with the Government of France for the purchase of 13,000,000 gallons of alcohol annually. If the deal goes through, the big Ruhr plant will be turning out buna at a rate of 30,000 tons a year.

The scheme could be a boon to France as well as West Germany. French vineyards turn out a chronic surplus of wine; some 50,000,000 gallons of the beverage have remained unconsumed at the end of production seasons in recent years. To keep the wine growers happy, the French government buys most of the excess supply each year and converts it into industrial alcohol. The government has about 158,000,000 gallons on hand and would be happy to have the Germans relieve them of some of this burden.

For the West German economy, the wine-into-rubber project could mean savings in millions of dollars worth of foreign exchange spent annually on rubber imports. If the Huels plant's production reaches the planned 30,000 ton annual level, it would be able to supply almost one third of West Germany's total annual rubber needs. Last year, West Germany had to buy more than 100,000 tons of natural and synthetic rubber from outside sources, at a cost of well over the equivalent of $50,000,000.

The Huels firm already is producing buna on a pilot plant basis. Recently, output has averaged about 250 tons a month. Production, however, has been limited both by Allied occupation regulations and by the high cost of production.

At the end of the war, the U. S., British and French occupation authorities banned the production of buna in West Germany altogether. Not until 1951 was West Germany allow to produce synthetic rubber, and even then output was restricted to 500 tons a month.

Prospective producers of synthetic rubber haven't been able to take advantage of even this limited quota. Using the only available raw materials, coal and acetylene, the production cost has run as high as the equivalent of 48c a pound, far above the level consumers could pay. If the French alcohol deal is successful, says Paul Baumann, Huels' managing director, his firm can produce buna for about 28c a pound.

It is expected that the U. S. and the other occupation authorities will remove the existing output limitation now in effect if the transaction for the French alcohol is successfully completed. "I see no reason why we wouldn't give Huels a green light to boost production to 30,000 tons a year" said one American authority. He stated that he expects the French and British authorities to also agree to the boost in production.

Germany became a major producer of synthetic rubber during Hitler's buildup for war in the late 1930's. The equivalent of some $33,000,000 was spent at four big I. G. Farben plants to develop a substitute if Germany lost access to natural rubber supplies.

At its peak, Germany had a production capacity of 150,000 tons of synthetic rubber a year, but Allied air raids kept actual production far below this volume. In ten years from 1935 to 1945, Germany produced a total of 500,000 tons.

The Huels plant, one of West Germany's most modern industrial units, currently employs 10,000 persons in various types of chemical manufacture. It is believed that the plant could reach a production level of 30,000 tons a year in short order.

Divided Germany is believed to have the only functioning synthetic rubber plants of any size in Europe. It has been reported that the Russians have put another former I. G. Farben synthetic rubber producer, the Schkopau plant in the East Zone, back into operation.

Quality Conference Planned

American and European buyers' complaints that Malaya is exporting substandard quality rubber will be investigated at an international conference to be held in Singapore on April 22. The Rubber Trade Association of New York and the Rubber Manufacturers Association are organizing the conference with Malayan authorities and Singapore rubber organizations. American manufacturers are said to feel that natural rubber quality, which slipped badly during the war years, is still below par. The proposals for the talks have been approved by the Packing and Marketing Committee of the International Study Group.

Purchases Synvar Stock

Officers and directors of Delaware Chemicals, Inc., located in Staten Island, N. Y., and Wilmington, Del., have purchased a substantial portion of stock in the Synvar Corp. and the Synvar Southern Corp., according to a recent announcement. The Synvar Corp., with headquarters at Wilmington, Del., manufactures complete lines of urea resins, phenolic resins, and phenolic molding compounds. For the past thirteen years, Synvar has been engaged in the production and development of synthetic resins for use in rubber, plywood, electrical, automotive, and other manufacturing industries. No changes are contemplated in the personnel of the Synvar Corp. Plans to merge Delaware Chemicals and its three associated companies with the Synvar companies are presently being studied. It is estimated that this merger will form a new organization having assets of several millions of dollars. Officials of Delaware Chemicals also announced that the planned expansion program to increase production at the Staten Island plant has been completed at an approximate cost of $150,000, and that the plant is operating at full capacity. Because of the purchase of the Synvar stock, however, construction of a new plant in northern New Jersey which was authorized in March, 1953 at an estimated cost of $1,000,000, has been delayed until plans for the companies have been better coordinated.

Fire Hits Seamless Rubber

Production at the Seamless Rubber Co., New Haven, Conn., was brought to a virtual halt when a fire struck the plant on February 3, routing some 1,200 employees. Thousands of pounds of natural and synthetic rubber were destroyed in the blaze, contributing to an unofficial estimate of $100,000 in damages. The fire was reported to have started in a sub-basement which was used for the storage of raw rubber. Limited production was started the day after the fire with full production awaiting the clean-up of debris and a full review of damages caused by the fire.

APS HIGH POLYMER DIVISION PLANS INTERESTING MEETING

The High Polymer Division of the American Physical Society has announced its program for the meeting which is scheduled for Thursday and Friday, March 18 and 19, at Detroit and Ann Arbor, Mich. The meeting will be divided into morning and afternoon sessions on both days. T. G. Fox will preside at the morning session on March 18, while J. D. Ferry will preside in the afternoon. On March 19, R. S. Marvin will preside in the morning, while the afternoon session will be presided over by R. F. Boyer.

On the morning of March 18, three invited and three contributed papers will be presented. They include:

"Effect of High Energy Radiation on Polymers" by A. Charlesby, Atomic Energy Research Establishment, Harwell, England.

"Theory of Orientation and Double Refraction in Polymers" by Edward F. Gurnee, Dow Chemical Co.

"Measure of Orientation in Polystyrene Monofilaments by Means of Double Refraction" by R. D. Andrews, Dow Chemical Co.

"Effects of Co^{60} Gamma Radiation on Formation and Degradation of Polymers" by Lindsey M. Hobbs, Douglas E. Brown and David W. Pletcher, University of Michigan. (Paper will be presented by Mr. Hobbs).

"A Dielectric High Frequency Method for Molecular Weight Determinations" by P. Debye, P. P. Debye and B. H. Eckstein, Cornell University. (Paper will be presented by Mr. P. Debye).

"A Field Induced Diffraction Method for Molecular Weight Determinations" by W. A. Barber, P. Debye and B. H. Eckstein, Cornell University. (Paper will be presented by Mr. Eckstein).

Thursday Afternoon

"Dynamic Mechanical Properties of Polyvinyl Acetate" by Malcolm L. Williams and John D. Ferry, University of Wisconsin. (Paper will be presented by Mr. Ferry).

"Slow Relaxation Mechanisms in Concentrated Polymer Solutions" by John D. Ferry, Malcolm L. Williams and Donald M. Stern, University of Wisconsin. (Paper will be presented by Mr. Ferry).

"A Calculation of the Dynamic Bulk Modulus of Polyisobutylene" by Robert S. Marvin, National Bureau of Standards, and H. S. Sack and R. Aldrich, Cornell University. (Paper will be presented by Mr. Marvin.)

"Steady-State Elastic Shear Compliance and Molecular Weight Distribution in Polyisobutylene" by Herbert Leaderman and M. Wales, National Bureau of Standards. (Paper will be presented by both.)

"Multiple Dispersion Regions in Rigid Polymeric Systems" by Rolf Buchdahl and Lawrence E. Nielsen, Monsanto Chemical Co. (Paper will be presented by Mr. Buchdahl.)

"The Effect of Crystallinity on the Dynamic Mechanical Properties of Polyethylene" by Lawrence E. Nielsen.

"Elastic and Dielectric Losses of Some High Polymers Near and Below the Second Order Transition Temperature" by H. S. Sack, T. R. Cuykendall and T. J. Woods, Cornell University. (Paper will be presented by Mr. Sack.)

"Ultrasonic Properties of Hycar OS-10 and Paracril 35" by J. L. Melchor and A. A. Petrauskas, University of Notre Dame. (Paper will be presented by Mr. Melchor.)

"Stress - Temperature - Time Studies Through the Second Order Transition Region" by D. G. Ivey A. Kwei, University of Toronto. (Paper will be presented by Mr. Ivey.)

"Measurement of Nuclear Induction Relaxation Times in Polymers" by V. R. Honnold, F. McCaffrey and B. A. Mrowca, University of Notre Dame. (Paper will be presented by Mr. Honnold.)

Friday Morning

The session on Friday morning will begin with introductory remarks by R. S. Marvin. Papers scheduled for the session include:

"The Nature of the Liquid and Glassy States" by W. D. Kauzmann (Princeton University).

"The Effect of Structural Variables on the Specific Volume and Glass Temperatures" by T. G. Fox, Rohm and Haas Co.

"Some Physical Properties of Polymeric Glasses" by R. F. Boyer, Dow Chemical Co.

"The Mechanics of the Molecular Motion in Bulk Polymers" by F. Bueche, Rohm and Haas Co.

"A Theory of Viscoelastic Behavior" by W. G. Hammerle, Textile Research Institute.

"The Dynamic Properties of High Polymers" by E. A. W. Hoff, Imperial Chemical Industries.

Friday Afternoon

This session will commence with an invited paper by John D. Hoffman of the National Bureau of Standards. Mr. Hoffman will speak on "Rotation of Chain Molecules in Crystals." Other papers scheduled for the session include:

"Experimental Investigation of the Statistical Theory of Rubber Elasticity" by F. P. Baldwin, J. Ivory and R. L. Anthony, University of Notre Dame.

"Energy Requirements of Mechanical Shear Degradation in Concentrated Polymer Solutions" by A. B. Bestul, National Bureau of Standards.

"Concentration Dependence of Mechanical Shear Degradation" by P. Goodman, National Bureau of Standards.

"Analysis of Reduced Viscosity Equations" by Wilfried Heller, Wayne University.

"The Infrared Spectrum of Polyethylene" by S. Krimm, University of Michigan.

HAWKINS, BOWLES AND PILCHER PROMOTED BY INTERNATIONAL SHOE

M. L. Hawkins

T. L. Pilcher

R. H. Bowles

M. L. Hawkins, formerly superintendent of the rubber plant of the International Shoe Co. at Hannibal, Mo., has been appointed manager of the company's Rubber Manufacturing Division. R. H. Bowles, formerly plant production superintendent at Hannibal, has been named plant superintendent succeeding Mr. Hawkins. T. L. Pilcher, who has served as personnel manager of the rubber plant since 1945, has been promoted to assistant plant superintendent succeeding J. R. Whelan, who was recently appointed superintendent of the company's newly-constructed rubber plant at Bryan, Texas. Mr. Hawkins joined International Shoe in 1925. Later the same year, he was transferred to the rubber plant as a foreman in the Heel Trimming and Packing Department. From there he advanced to general foreman. He became production manager in 1943, plant operations manager in 1945 and assistant superintendent in 1947. In 1949, he was named plant superintendent.

Mr. Bowles came to work for the company at the rubber plant as a production worker in 1928. He served as foreman from 1929 through 1951 when he was appointed production superintendent. Mr. Pilcher was graduated from Culver-Stockton College in 1931 and did graduate work in the University of Illinois and the University of Iowa. He taught school before he joined the rubber plant at Hannibal.

Installation of non-metallic sheathed cable is said to have been made easier by a smoother, cleaner surface on Anaconda Wire's new "Silver Dutrax." Tests show that the product can be pulled through joists with half the effort necessary when pulling ordinary non-metallic sheathed cable.

GERMAN PLASTICS AND RUBBER GROUP HOLDS MEETING IN HAMBURG

A meeting of the Plastics and Rubber Section of the German Chemical Association (Gesellschaft Deutscher Chemiker) was held in Hamburg, Germany, on September 15, 1953. The meeting featured the presentation of numerous technical papers by outstanding European chemists in both the rubber and plastics fields.

The concepts of cross-linking reactions in rubber with sulfur during the vulcanization process and the mechanism involved were discussed in a paper on "A Survey of the Present Knowledge of the Mechanism of Vulcanization" by Dr. J. van Alphen (Delft). Vulcanizates were evaluated by the extent of swelling in suitable solvents and on the basis of mechanical properties.

It was pointed out that not only are sulfur cross-links formed during vulcanization, but that sulfur is also found in cyclical linkages which do not contribute to vulcanization. The influence of vulcanization temperature on the rate of reaction was discussed as were other factors, such as the presence of oxygen on the mechanism of the vulcanization reaction.

Dr. P. Schneider (Leverkusen) delivered a paper on "Antioxidants and their Influence on the Oxidation of Vulcanized and Unvulcanized Rubber." The speaker noted that the structural changes which unsaturated high polymers undergo under the influence of oxygen, ozone, heavy metals, and light and heat, under static as well as under dynamic conditions, depend essentially on the nature of the polymer. Oxygen plays a predominant part in these changes, and its action can be reduced by the addition of antioxidants.

Influence of Antioxidants

The influence of antioxidants on oxidation can be determined by different methods, the speaker noted. Kinetic investigations can be carried out advantageously by the volumetric determination of the bound oxygen. Conventional and commercial antioxidants were classified and discussed by the speaker and the importance of substituted phenols for use in synthetic rubber and the synergistic effects of mixtures of such compounds were pointed out.

Dr. Schneider stated that secondary aromatic amines act in raw, unvulcanized rubber as oxidation catalysts, despite the fact that they exert a considerable influence on vulcanized rubber against oxidation. The reactions taking place during oxidative aging proceed over radical chains. These reactions can be influenced by the addition of antioxidants. Secondary aromatic amines act by a different mechanism than do the phenolic antioxidants.

During decomposition of the initially formed high polymeric hydroperoxides, secondary reaction products are formed. The formation of these products and the chemical changes which the antioxidants undergo, were interpreted with the aid of model experiments. The formation of n,n'-diphenyl n, β-naphthyl 1,2-naphthylene diamine could be established among other compounds in aged phenyl β-naphthylamine-containing vulcanizates. It is formed during inhibition of oxidation from phenyl β-naphthylamine.

Dr. G. Bier (Frankfurt) presented a paper on "Preparation and Properties of Fluorine-Containing Polymers" at the meeting. He observed that the stability of fluorine-substituted aliphatic compounds increases with the number of fluorine atoms, as can be seen from the reduction of the internuclear distances, including that of the C-C linkages. The nature and degree of reactivity of fluorine-substituted compounds differ in many respects from those of the corresponding hydrocarbons. The readiness with which fluorine-containing olefins polymerize can be deduced from other reactions. Field influences, electromeric and steric effects play an important role in general and in polymerization reactions of fluorine-substituted compounds.

Polymerization Methods

The merits and disadvantages of different polymerization methods were discussed by the speaker. It was shown (using trifluoroethylene as an example) that the polymerization of fluorine-substituted olefins follows known fundamental laws. Molecular weight determinations, Dr. Bier stated, are at present not reliable. The molecular structure seems to depend on the conditions of polymerization. Products of low molecular weight and of oily to wax-like consistency can be obtained by polymerization in the presence of effective chain terminators.

Olefins with negative double bonds are particularly suited for copolymerization with fluorine-substituted olefins. Processing and properties, including heat and chemical resistance and electrical properties, were also discussed with the aid of tables and demonstration of samples.

"Density Measurements and Structural Disorder of High Polymers" was the title of a paper presented by Dr. G. V. Schulz (Mainz). High polymers, he said, are in a state of reduced density and increased energy below the transition point (glassy state) as compared to that of the molten polymer (above the transition temperature). When dissolved in organic solvents, they assume a state of energy and density which corresponds to that of the molten polymer.

Measuring Heat of Solution

Measurements of the heat of solution as a function of temperature and degree of polymerization, as well as of the apparent specific volume in solution, permit the characterization of the two states with respect to energy content and space requirement. Volumetric density measurements in the glassy state are carried out with the aid of non-dissolving liquids (methanol, heptane) and inert gases (He, Ar, H_2, N_2). The changes with time and the activation energies determined provide certain information about the molecular structure of organic glasses.

"Texture of Crystalline High Polymers as Determined with the Electron Microscope" was the title of another paper delivered at the meeting, this one by Dr. H. A. Stuart (Hanover). The speaker discussed several peculiarities of the crystallization of high polymers and the fundamental, finite temperature range of melting. In surveying the parameters of the molecular texture, the ratio of crystalline to amorphous polymer, the magnitude of crystalline regions and the importance of long spacing interferences were discussed. The light microscope as well as the electron microscope show spherulite, grain and fibrillar structure. Relations exist between molecular structure, the extent of crystallization and the mechanical properties, Dr. Stuart noted.

Introduces New Fatty Acids

Emery Industries, Inc., Cincinnati, Ohio, has announced the commercial availability of three new, low-cost, structurally modified fatty acids, "994-R", "995-R", and "996-R". Said to be unlike anything previously available, these acids possess the color and heat stability associated with high-quality stearic and palmitic acids yet have the consistency and solubility characteristics of distilled tallow fatty acids. These differences are especially significant, the company states, since two of these acids are practically saturated (2 to 4 I.V.) C_{16} and C_{18} monocarboxylic acids. The unique character of these acids is illustrated by the solubilities of their potassium soaps. At 16% real soap concentrations at room temperature, solutions are clear and completely fluid, whereas potash soaps of stearic acid are semi-solid in concentrations even as low as 1%. In hydrocarbon systems, the aluminum soaps of these unique acids possess outstanding gelling properties. Worked stability of lubricating greases made from the aluminum soaps of these new products is comparable to that of commercial high-gel stearates, and much superior to that of soaps of both stearic and fish fatty acids. These materials are now available in tankcar quantities. Shipment is made in aluminum tankcars or specially lacquer-lined 55-gallon drums.

Okonite Absorbs Subsidiary

Okonite Co. of Passaic, N. J., has announced that, effective April 1, the Okonite-Callender Cable Co., Inc., its wholly-owned subsidiary, will be merged with the parent company. This corporate change will make possible the streamlining of certain operations and, at the same time, will eliminate the duplication of effort that was required while handling that manufacturing plant as a separate organization. The Okonite-Callender plant was established in Paterson, N. J., in 1924 as a joint venture of the Okonite concern and British Insulated Callender's Cables, Ltd. of England. The half-interest of the British firm was purchased by Okonite in 1948. The trade marks "Okonite-Callender" and "Okocal" will be retained to identify the paper-insulated power cables and splicing materials produced by the 500 employees in the manufacturing unit. There will be no change in personnel or products.

Need a personal file of RUBBER AGE? Use the coupon on page 998.

USDA ANNOUNCES DEVELOPMENT OF NEW VINYL CHLORIDE COPOLYMERS

New vinyl chloride copolymers in which one of the monomers involved—vinyl stearate—is obtained from inedible animal fats have been developed by the United States Department of Agriculture, according to a recent announcement. The new copolymers may be either rigid or flexible, depending on the content of vinyl stearate. Copolymers with a high vinyl stearate content are similar to compositions of polyvinyl chloride and commercial plasticizers in their flexibility, elongation, tensile strength, and other physical properties.

"The outstanding advantage of the new copolymers is the 'built-in' plasticizer," said Dr. P. A. Wells, Chief of the Agricultural Research Service's Eastern Utilization Research Branch, in Philadelphia, Penna., where the work was done. "Because the vinyl stearate is chemically bound in the copolymers, this plasticizer cannot migrate or evaporate."

Copolymers with a low vinyl stearate content are essentially rigid. They have a lower milling temperature and a lower bulk viscosity temperature coefficient than commercial vinyl plastics now available. These advantages make them easier to handle in such operations as calendering, molding and extrusion because less stringent control of pressure and temperature is required.

Both the rigid and flexible types of the new copolymers may be cured with polyfunctional amines to infusible insoluble resins. Because of their relatively low milling temperatures they may be compounded and preformed at lower temperatures (about 200°F.) and then cured at higher temperatures (about 340°F.). The flexible type retains much of its flexibility after it is cured.

Detailed information on the preparation and properties of the new copolymers is available in a new USDA publication AIC-366, entitled "Vinyl Plastics Modified with Chemicals from Animal Fats. Copolymers of Vinyl Chloride and Vinyl Stearate," by William S. Port, Edmund F. Jordan, Jr., William E. Palm, Lee P. Witnauer, John E. Hansen and Daniel Swern. Copies of this publication may be obtained without charge from the Agricultural Research Service, in Washington, D. C., or from the Eastern Utilization Research Branch, U. S. Department of Agriculture, Philadelphia 18, Penna. Samples are also available upon request from the Eastern Branch.

Salamon Joins Acme-Hardesty

Felix "Fil" Salamon has joined the sales staff of the Acme-Hardesty Co., New York, N. Y., producers of stearic acid, red oil, glycerine, and animal and vegetable fatty acids. Mr. Salamon has been operating recently as a manufacturers' representative, covering chemicals for several prominent concerns. He was previously associated with the Binney & Smith Co. for more than twenty-two years. Here, he was in charge of sales for the Rubber Compounding Accessories Department, specializing in fatty acids, chemical plasticizers and specialty materials.

VULCANIZED RUBBER ANNOUNCES APPOINTMENT OF WERNER AND LEWIS

Robert G. Werner

David Lewis

Vulcanized Rubber and Plastics Co., New York, N. Y., has announced the promotion of Robert G. Werner to general manager. For the past three years, Mr. Werner had been assistant to the president of the company. Vulcanized Rubber has also announced that David Lewis has been appointed director of sales. Mr. Lewis was formerly sales manager for the Fruehauf Trailer Corp.

Alliance Tire Declares Dividend

Alliance Tire & Rubber Co. of Hadera, Israel, has declared its first dividend after only one year of operation, according to Arthur Taubman, company president. Mr. Taubman reported that the Alliance Tire board of directors had declared a six-months interim 3% dividend. This represents $1.50 per share to nearly 700 American stockholders and it applies against earnings for the fiscal period from April to September, 1953 inclusive. The dividend announcement was made at a special luncheon in Chicago, Ill., on February 7, honoring American directors and stockholders of the company. Hosts for the meeting were the Dayton Rubber Co. and the Anchor Rubber Co. In discussing the Israeli company Mr. Taubman said: "This success is considered amazing for a firm which has been in production for only one year. It is even more remarkable when one considers the many obstacles that had to be overcome by the young company in the new Israel." Alliance Tire is the largest tire plant in Israel.

Plan Instrumentation Symposium

The Institute of Industrial Health and the School of Public Health of the University of Michigan, Ann Arbor, Mich., co-sponsors of the Symposium on Instrumentation which will be held at Ann Arbor on May 24 to 27, have announced final plans for the event. In addition to a number of interesting symposiums, nineteen technical papers will be given by authorities in specific phases of instrumentation. An encyclopedia-type book will grow out of the symposium. Papers presented at the symposium will be published in this illustrated volume which will include both the comprehensive review and technical papers, as well as data supplied by the manufacturers of the instruments under discussion.

3M Suit Decision Delayed

A New York State Supreme Court Justice has reserved decision on three pretrial motions in a suit brought by the Minnesota Mining & Manufacturing Co. of St. Paul, Minn., against the Technical Tape Corp., of New York, N. Y., involving the manufacture of cellophane tape. Minnesota Mining contends that Technical Tape hired F. C. Beyer away from the company and obtained Minnesota Mining trade secrets from him. Mr. Beyer also is named as a defendant in the action along with Paul Cohen and Saul Shalita, president and vice-president, respectively, of Technical Tape. Another defendant is the Vernon Chemical & Manufacturing Corp. of Mount Vernon, N. Y. The Justice reserved decision on these motions: (1) One by the defense to dismiss the suit on the ground that it failed to provide sufficient information and did not clearly define the trade secrets that allegedly were copied; (2) One by the defense to dismiss the suit as it applies to Vernon Chemical on the ground that Vernon Chemical had no part in the manufacture of the tape in question and only sold the product made by Technical Tape, and (3) One by the plaintiffs to prohibit Technical Tape from hiring any Minnesota Mining employees pending outcome of the trial. Minnesota Mining contended in its complaint that it had been damaged to the extent of more than $1,000,000, but left it to the court to decide what damages, if any, should be awarded.

RCA Changes Plasticizer Name

Rubber Corporation of America, Brooklyn, N. Y., has announced that its recently introduced plasticizer "Epox-S" an epoxidized triester, will henceforth be sold under the tradename of "RC Plasticizer E-S." Other than the name, there are no changes.

NEOPRENE CONSUMPTION IN 1953 15% ABOVE RECORD SET IN 1952

An all-time high in the consumption of neoprene was reached in 1953, and generally favorable growth is forecast for 1954 as well, according to a recent announcement by E. I. du Pont de Nemours & Co., Inc. In a statement supplementing the recent announcement of plans to build a new neoprene plant at Montague, Mich., the company disclosed that domestic consumption of the versatile synthetic rubber had increased more than 15% over the record set in 1952.

Gains were sharpest in the automotive field, especially for items such as hose, motor mounts, bushings, and ignition wiring. Significant increases were made in the use of neoprene for shoe soles, industrial belting, protective linings and coatings, tires, and coated fabrics. The vast expansion of industrial utilities also had a pronounced effect on 1953's sales volume, since neoprene is almost universally used as jacketing on wire and cable.

While demand for neoprene shattered all previous records, stocks remained plentiful throughout most of the year. December inventories of both the company and its customers were estimated at just over two month's supply at the present rate of consumption.

This marks the first extensive period in neoprene's 22-year history during which production has maintained a comfortable margin over industry's rapidly growing requirements. Annual consumption of neoprene doubled between 1947 and 1952, and repeated additions to DuPont's present plant at Louisville, Ky., were barely able to keep pace. A slight lead was established about midway of last year, and the supply picture has been brightening ever since.

Current capacity of the Louisville Works has proved ample for immediate needs. Indications are that demand will continue to grow, however, and DuPont has taken steps to insure against future shortages. An expansion project is now under way at Louisville to provide a substantial increase in annual capacity until the new Montague plant begins operation in 1956. Initially, the new plant is scheduled to add another 25%, so that DuPont's prospective neoprene capacity will be a third greater by 1956 than it is today.

Perfects Largest Paper Bag

Equitable Paper Bag Co., Long Island City, N. Y., has produced what is said to be the world's largest paper bag. The new bag has a multitude of economy uses, and will be of importance to manufacturers of large and small items. The bag is big enough to hold a 9 by 14-foot rug or dozens of grosses of small items. General uses suggested for the bag include rugs and carpets, rubber hose and tubing, artificial leather and other coated materials, and many other items. Equitable Paper Bag has developed a new machine to produce this type of bag. The machine is 70 feet long and cost $150,000. It can turn out a bag of various weight papers and up to two-ply and two-color printing 14 feet long.

Farm Vehicle Survey

Figures released recently by the *Farm Implement News* show that as of January 1, 1953, there were 2,536,000 motor trucks and 4,451,000 automobiles on farms in the United States. Over 47% of the trucks and almost 54% of the automobiles were accounted for in the 15-states of Mid-America. On a per 1,000 farm basis, ownership of automobiles and trucks in the Midwest exceeds that for the rest of the country by 33%.

URW Hits Strike Vote Plan

G. L. Patterson, general counsel of the United Rubber Workers, C.I.O., in a brief filed with the Senate Labor Committee observed that a government-conducted strike vote, if made part of the Taft-Hartley labor management law, would make strikes tougher to settle. "Once the employees had voted in a government-conducted election in favor of continuance of a strike, the reaction would be that they were engaging in a strike that had been sanctioned and approved by the government," he said. "This would result in encouraging the continuance of strikes and protracting their duration." Mr. Patterson pointed out that in 1953 nearly 50% more man-days were lost as a result of industrial accidents than in work stoppages. "It might be better if we devoted more legislative attention to industrial safety and less to efforts restricting the right of labor to strike," he declared. Mr. Patterson also termed the proposal which would require corporation executives to sign a non-Communist affidavit "ridiculous." He urged the provision requiring non-Red oaths by labor officials be striken from the present act.

Licenses Four New Firms

U. S. Rubber Co. has licensed four additional manufacturers of vinyl coated fabrics to manufacture and sell its stretchy vinyl upholstery with elastic fabric backing. The four manufacturers licensed to make the stretchy upholstery are: Goodall-Sanford, Inc. of Reading, Mass.; Columbus Coated Fabrics Corp. of Columbus, Ohio; Athol Manufacturing Co. of Athol, Mass.; and Pantasote Co. of Passaic, N. J. The additional licenses have been issued, according to the company, because of the rapidly increasing demand for elastic upholstery. Elastic Naugahyde vinyl upholstery was introduced by U. S. Rubber in 1950. Demand for the material was so great that U. S. Rubber, in the spring of 1952, licensed four manufacturers to make and sell the upholstery: Masland Duraleather Co., of Philadelphia, Penna.; Federal Leather Co. of Belleville, N. J.; Landers Corp. of Toledo, Ohio; and Textileather Corp. of Toledo, Ohio.

Take a long time for this copy of RUBBER AGE to reach your desk? Use the coupon on page 998.

GENERAL TIRE PLANNING TO BUY BOLTA AND TEXTILEATHER FIRMS

General Tire and Rubber Co. has announced plans to take over the Textileather Corp. of Toledo, Ohio, and the Bolta Co. of Lawrence, Mass., two of the nation's biggest plastic film and plastic sheeting manufacturers. William O'Neil, General Tire president, said he is negotiating separately with the two concerns for mergers. Under the proposed merger agreements, stock of Textileather and Bolta would be exchanged for General Tire preferred. General Tire would operate the two companies as divisions of its plastics operation.

The multi-million-dollar transactions are subject to approval by stockholders and final financial details will not be made public until the plans are submitted to them, Mr. O'Neil said. If the mergers are made, he said, the two plastics companies will continue operations with no change in policy, administrative, manufacturing or sales personnel.

Textileather, whose products are widely used in the automotive industry, makes such items as plastic-coated fabrics, upholstering, bookbinding, luggage, handbags and workers' clothing. Bolta's plants are recognized for their printing, embossing and styling of plastic film and sheeting. The combined annual sales of the two concerns in 1953 was more than $50,000,000.

Building New Southern Plant

Stowe-Woodward, Inc. of Newton Upper Falls, Mass. has announced the signing of purchase agreements for a 16-acre tract of land in Griffin, Ga. The land purchased completes long contemplated plans for a new plant to make Stowe-Woodward rubber covered rolls more readily available to the rapidly expanding paper and textile industries of the South. Plans for the new plant are not yet complete but will provide for the manufacture of the highly specialized rubber roll coverings required in the manufacture of paper and in textile finishing. E. W. Peterson, Stowe-Woodward's president, said that groundwill be broken as soon as architect's plans for the new building, covering twenty-five to thirty thousand square feet, are complete. Mr. Peterson also said that no change in the operation or personnel at the Newton Upper Falls plant is contemplated. The initial work force for the Griffin plant, with the exception of a few highly skilled technicians, will be Griffin residents.

Evans Thiomalic Acid

Evans Chemetics, Inc., New York, N. Y., has introduced "Thiomalic Acid", a polyfunctional compound which undergoes the reactions typical of both mercaptans and di-carboxylic acids. It is claimed as being effective in reducing the color of crepe rubber and as a tackifier for butadiene-type synthetic rubber. Its esters have been claimed as air-hardening coating compounds. An off-white powder in appearance, the product has a molecular weight of 150.15 and a melting point at 150°C. minimum. Its ash content is 0.5% maximum.

6th AIEE Conference Planned

The Subcommittee on Rubber and Plastics Industries of the Committee on General Industry Applications, American Institute of Electrical Engineers, will hold a two-day conference on rubber and plastics at the Mayflower Hotel in Akron, Ohio, on April 5 and 6. This is the Sixth Annual Conference on Rubber and Plastics sponsored by the organization. A tentative program has been made available for the conference. John Grotzinger (Goodyear) will be the keynote speaker for the session on April 5, with five papers scheduled for presentation. These papers are: "Training Young Engineers" by Arthur Carpenter (Goodrich); "Magnetic Clutches and Brakes for Rubber and Processing Machine Drives" by A. E. Lillquist (Cutler-Hammer); "Preventive Maintenance of Large Electric Motors and Controls in Rubber Mills" by Kurt John (U. S. Rubber); "High Voltage Motor Controllers for the Rubber Industry" by F. J. Render (G-E), and "Selection of Drives for the Continuous Processing of Plastic Films" by A. G. Payne (Monsanto Chemical). Three papers have been scheduled for the morning of April 6, while in the afternoon, the program calls for an inspection trip through Plant 2 of the Firestone Tire & Rubber Co. Papers to be given on the morning of April 6, include: "Recent Developments in Insulation of Large Electrical Machines" by G. L. Moses (Westinghouse); "Magnetic Amplifiers for the Rubber and Plastic Industries" by John Santer (Clark Controller), and "Today's Challenge in Human Relations" by Ben H. Taylor (Goodrich).

New Ferro Stabilizers

Ferro Chemical Corp., Bedford, Ohio, has introduced two new stabilizing agents, "Stabilizer No. 180-X" and "Stabilizer No. 203-X". Stabilizer No. 203-X is based on cadmium and "chelate"-type stabilizers. Being a synergistic combination of two types of vinyl stabilization in liquid form, 203-X is said to offer the vinyl industry versatility, efficiency and convenience. No. 180-X is a barium laurate prepared by an exclusive method, producing a granular dust-free product free of contaminating salts. No. 180-X has a specific gravity of 1.21, while 203-X has a specific gravity of 1.137. Used in combination, the development of yellowness in both clear and pigmented film and sheeting is said to be greatly reduced. The end result is the same in both clear and pigmented formulations, namely brighter, "cleaner" stock.

Announces Rubatex Expansion

Great American Industries, Inc., has reported that the installation of new presses will nearly double the capacity of its Bedford, Va., insulation manufacturing plant. Robert T. Dunlap, president, said output of cellular rubber insulation by the company's Rubatex Division is expected to reach 3,120,000 board feet, compared to 1953 production of 1,736,000 board feet. The product is used in meat packing refrigeration plants, refrigerated freight cars and over-the-road refrigeration trucks.

Wyandotte Promotes Jarvis

L. A. Jarvis

L. A. Jarvis has been named technical service representative of the Calcium Carbonate Department, Michigan Alkali Division, Wyandotte Chemicals Corp., Wyandotte, Mich. Mr. Jarvis is a graduate of Michigan State College where he majored in chemistry. In 1943 he joined Firestone Tire and Rubber Co. where he concentrated his efforts on product development and quality control. Joining Wyandotte in 1949 as a rubber and plastic research chemist, Mr. Jarvis was given the responsibility for pigment evaluation, application research, product development and quality control on "Purecal" (Wyandotte's precipitated calcium carbonate) and other rubber chemicals. In his new post Mr. Jarvis will assist in customer service on technical problems, establish new applications for Purecal and maintain proper quality specifications on calicum carbonate for use in related rubber and plastic products.

D-456 Vinyl Combining Adhesive

Claremont Pigment Dispersion Corp., Brooklyn, N. Y., has announced the availability of a new vinyl combining adhesive, "No. D-456," which has been found to provide an excellent bond between vinyl plastic and nylon or rayon backing. Depending upon the method of application, the resultant laminate has passed bond tests of up to 40 pounds per linear inch, the company states. This adhesive, which consists of 100% solids, may be applied by a knife coating or printing process to either the vinyl film or the fabric backing. Lamination is effected by applying pressure, and heating to the point of plastisol fusion (350° F.).

New Witco Technical Bulletins

Witco Chemical Co., New York, N. Y., has released two new technical service bulletins. The first of these, E-6, covers the properties and uses of dioctyl (di-2-ethylhexyl) phthalate (DOP) as a primary plasticizer for vinyl resins. The other, E-7, gives the properties and uses of the company's di-iso-octyl phthalate (DIOP), which also finds use as a plasticizer in vinyl film. Both publications are available on request to the company.

Dow Corning "RTV Silastic"

A new silicone rubber that vulcanizes at room temperature has been developed by the Dow Corning Corp., Midland, Mich. Identified as "RTV (room temperature vulcanizing) Silastic," it develops the high and low temperature stability, water repellency and chemical resistance characteristic of silicone rubber within 24 hours after application. Neither heat, pressure nor full exposure to air is required to cure sections up to ⅛-inch thick. Sections up to 1-inch thick may be cured under pressure up to 50 psi, however, and curing time can be substantially shortened if heat is applied after the rubber has set, the company states. RTV Silastic is available in several solvent-free consistencies, ranging from fluid enough to flow under its own weight to heavy enough to require milling. It is shipped and stored in the form of two separate components, each containing a catalyst. When the components are mixed in equal parts by weight, they react to form a non-heat vulcanizing system. The material sets in approximately 4 hours, cures in 24 hours, and develops optimum properties in 4 to 7 days. The addition of xylene or a comparable solvent can extend working time by as long as 3 weeks. The material still requires only 2 days after setting to cure; 6 to 7 days to develop optimum properties. The cost of RTV Silastic is comparable to that of standard raw Silastic stocks and pastes.

Goodrich Driving Safety Booklet

"Tommy Gets the Keys" is the title of a new cartoon booklet recently published by the B. F. Goodrich Co., which was prepared with the purpose of educating teen-age drivers in safe and sane operation of an automobile. Young people, especially those who are learning to drive or those who have recently received their licenses, will find the story realistic, colorful and dramatic. Several million copies are being printed, with the first 1,400,000 scheduled to go out as inserts in high school current event publications. Additional copies are available free of charge from Goodrich Public Relations.

Rubber Tile Flooring Folder

A complete start-to-finish guide to installing a rubber tile floor is available in a new folder being offered free of charge by the Rubber Flooring Division of The Rubber Manufacturers Association, 444 Madison Ave., New York 27, N. Y. The folder includes a chart on which to diagram the room and lay out the floor pattern, instructions on preparing the subfloor, installing the rubber tile, and on maintaining the finished floor.

H. A. Schlosser Co. Formed

Due to the death of Charles Berlow, the firm of Berlow & Schlosser, Providence, R. I., has been dissolved. In its place, Harry A. Schlosser has formed H. A. Schlosser & Co., at 401 Industrial Bank Building, Providence 1, R. I., as sales representatives to the rubber industry. The telephone number is Gaspee 1-4039.

FORT WAYNE HOLDS PANEL ON OIL-RESISTANT SYNTHETICS

The third meeting of the 1953-54 season held by the Fort Wayne Rubber and Plastics Group on February 11 at the Hotel Van Orman in Fort Wayne, Ind., featured a panel discussion on "Oil-Resistant Synthetic Rubbers." Moderator for the panel discussion was H. G. Crosland (Chicago Rawhide), while the speakers were E. D. Cunningham (Precision Rubber), Grover Duke (Goodrich), and W. R. Malcolmson (DuPont).

In opening the discussion, Mr. Crosland noted that there are six basic synthetic rubber polymers available to the compounder. These include the polysulfides, silicones, nitrile rubbers, chloroprenes, polyacrylates, and the tetrafluoroethylenes. He noted the basic attributes of each and noted the manner in which each finds its broadest use.

Mr. Malcolmson, for his part in the panel discussion, presented a paper entitled "Neoprene's Place in the Oil-Resistant Rubber Field." He briefly reviewed the available types and then presented a short resume of the properties which are responsible for the usefulness of the neoprenes. Mr. Malcolmson also discussed the general relationships between the neoprenes and the nitrile rubbers.

"Oil-Resistance of Nitrile Rubber" was the title of the paper presented at the panel discussion by Mr. Duke, who limited his discussion to copolymers of butadiene and acrylontrile, as the nitrile rubbers available to the rubber compounder are made by the copolymerization of these two monomers. The speaker stated that the oil-resistance of a nitrile rubber compound depends primarily on the acrylonitrile content of the rubber. This general relation, he said, holds true for blends of nitrile rubbers with different acrylonitrile contents and blends of a nitrile rubber with polybutadiene.

Mr. Cunningham chose as his topic, "Rubber—A Dynamic Engineering Material," and pointed out that a vast amount of research, development and engineering go into the countless number of rubber items produced every day. The speaker observed that there is no one textbook which even touches on the engineering properties of rubber. The diversity and scarcity of engineering information coupled with the prevalence of misinformation has created a clamoring demand for standards.

The speaker discussed some of the physical properties which are seldom measured in engineering applications, such as snapback, resiliency, hysteresis, creep, temperature range characteristics, modulus at low elongation-tension load below 100% stretch, and Joule effect.

Akron Plans Spring Meeting

The Spring Meeting of the Akron Rubber Group to be held on April 2 at the Mayflower Hotel in Akron, Ohio, will feature an address by Dr. Hubert N. Alyea of Princeton University, who will speak on "Atomic Energy—Weapon of Peace." Dr. Alyea did government research at Princeton during World War II and is now associate professor of chemistry.

Coming Events in the Rubber Industry

Mar. 25. Southern Ohio Rubber Group, Spring Technical Outing.

Mar. 26. Boston Rubber Group, Spring Meeting, Hotel Somerset, Boston, Mass.

Mar. 26. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Apr. 1. Rhode Island Rubber Club, Spring Outing.

Apr. 2. Akron Rubber Group, Spring Meeting, Mayflower Hotel, Akron, Ohio.

Apr. 2. New York Rubber Group, Spring Meeting, Henry Hudson Hotel, New York, N. Y.

Apr. 6. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Apr. 8. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Apr. 9. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

Apr. 14-16. Rubber Division, A.C.S., Spring Meeting, Hotel Brown, Louisville, Ky.

Apr. 21. Washington Rubber Group.

Apr. 30. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Apr. 30. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

May 4. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

May 14. Buffalo Rubber Group in Joint Session with the Ontario Rubber Section, C.I.C., General Brock Hotel, Niagara Falls, Ont., Canada.

May 14. Connecticut Rubber Group.

May 19. Washington Rubber Group.

June 3. Rhode Island Rubber Club, Summer Outing.

June 5. Southern Ohio Rubber Group, Summer Outing.

June 8. Buffalo Rubber Group, Summer Outing, Transit Valley Country Club, East Amherst, N. Y.

June 10. New York Rubber Group, Summer Outing, Doerr's Grove, Milburn, N. J.

June 12-13. Los Angeles Rubber Group, Outing, Miramar Hotel, Santa Barbara, Calif.

June 18. Akron Rubber Group, Summer Outing.

June 18. Boston Rubber Group, Summer Outing.

June 22-25. Institution of the Rubber Industry, Third Rubber Technology Conference, London, England.

June 25. Detroit Rubber & Plastics Group, Summer Outing.

Aug. 3. New York Rubber Group, Golf Tournament, Baltusrol Golf Club, Springfield, N. J.

Sept. 15-17. Rubber Division, A.C.S., Fall Meeting, Hotel Commodore, New York, N. Y.

Sept. 18. Connecticut Rubber Group.

Sept. 23. Southern Ohio Rubber Group, Fall Technical Meeting.

Oct. 5. Buffalo Rubber Group, Westbrook Hotel, Buffalo, N. Y.

Oct. 5. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Oct. 8. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

Oct. 15. Boston Rubber Group, Fall Meeting, Hotel Somerset, Boston, Mass.

Oct. 22. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Nov. 3. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Nov. 18. Rhode Island Rubber Club, Fall Meeting.

Dec. 3. Los Angeles Rubber Group, Xmas Party, Ambassador Hotel, Los Angeles, Calif.

Dec. 8. Buffalo Rubber Group, Xmas Party, Buffalo Trap and Field Club, Williamsville, N. Y.

Dec. 10. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 10. Detroit Rubber & Plastics Group, Sheraton Cadillac Hotel, Detroit, Mich.

Dec. 10. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 18. Southern Ohio Rubber Group, Xmas Party.

Firestone Sidewall Compound

Passenger tires that retain the "new look" for the life of the original tread mileage are now being produced by the Firestone Tire & Rubber Co., Akron, Ohio. Company officials stated that the solving of a specific sidewall problem in an area on the west coast where heavy concentrations of ozone and smog contributed to rapid weather checking, cracking and discoloration of white sidewall tires, led to the development of a new chemical ingredient now used in all Firestone tires—black as well as white sidewall. The new compound is said to practically eliminate radial cracks, reduces oxidation and weather checking, preserves the original appearance of the tires and gives added resistance to the aging of tires used in every section of the country. In recent comparison tests, the new Firestone sidewall showed a 60% greater resistance to original crazing than any other tire. The same series of tests rated the new Firestone first in appearance after 1200 hours of roof exposure.

Goodrich Torsilastic Springs

According to the B. F. Goodrich Co., Akron, Ohio, more than 740 new buses operated by the Chicago Transit Authority are now equipped with "Torsilastic" springs. The Torsilastic spring consists of a metal shell and central shaft, with the space between shell and shaft filled with rubber bonded to the metals. Either the shaft or the shell is held stationary while the other is partly rotated by a torque arm. All the springing is accomplished by the twisting, "wind-up" movement in the rubber. Less than 100 pounds of rubber are needed to suspend an entire bus chassis, weighing 20,000 pounds, in a cushion of rubber for complete rubber insulation. According to Goodrich, the unique spring eliminates the metal-to-metal path for vibration and road noises found in other suspension systems. There are no bearings to be lubricated or serviced, no abrasion, rust or wearing action from dirt, water or mud and the rubber spring cannot develop squeaks or rattles.

Revises Shipping Method

Injection Molders Supply Co., 3514 Lee Road, Cleveland 20, Ohio, advises that henceforth all shipments of their genuine "Silicone Spray Mold Release" are being made on a prepaid or full minimum freight allowed basis. According to a recent statement, the company is maintaining top quality and full value in its Silicone Spray Mold Release. No reduction in costly silicone content, no change to a "wet," lower cost propellant or makeshift container is contemplated. The exclusive all-metal spray head is retained because its faster action saves cycle time and reduces operator fatigue, more than offsetting its added cost. In addition, the company has warned its customers to beware of recent cheapened imitations of the IMS Mold Release because virtually exact duplicates of IMS data sheets have been unscrupulously issued in an apparent attempt to confuse and mislead the user, the firm states.

Powell Joins Alco Oil

A. E. Powell

Alco Oil and Chemical Corp., Philadelphia, Penna., has announced that A. E. Powell has joined its sales staff to assist in the development and service of new products. Upon graduating from the University of Rhode Island in 1930, Mr. Powell joined the U. S. Rubber Co. and remained there in development work until 1937, at which time he joined the Rubber Division of the Flintkote Co. as chief chemist. During 1942 and 1943, Mr. Powell served with the Rubber Reserve Company in Washington, D. C., after which he returned to Flintkote in a sales-service capacity. In 1945, Mr. Powell helped form the Pioneer Latex and Chemical Co., Middlesex, N. J., and was affiliated with this company as vice-president in charge of rubber sales and treasurer until his resignation last year.

Textileather Expands Facilities

A construction project totaling more than $200,000 is under way at the Textileather Corp. plant in Toledo, Ohio. Included in the project are two warehouses. Company officials said the larger warehouse will cover 32,000 square feet while the other has approximately 15,000 square feet. The larger unit will be used for storage of plastic coated fabrics which are stock items with the company and also for warehousing of customer stocks. The large warehouse is connected to the main plant of the company and finished plastic coated fabrics will be moved into the new building by conveyor system.

Snow-White Softseam Cement

Anchor Adhesives Corp., Flushing, N. Y. has announced the development of "Snow-White Softseam" cement. This new improved Softseam foam rubber cement is said to be excellent for foam rubber splicing because of its quick tack loss and exceptionally soft seam. Snow-White Softseam bonds quickly, forming an almost invisible seam. It eliminates the dark bonding line common with most foam rubber adhesives, the company states. Technical data, sample and prices are available upon request.

Connecticut Installs Officers

The Winter Meeting of the Connecticut Rubber Group held on February 12 at the Barnum Hotel in Bridgeport, Conn., featured the installation of new officers for the 1954 season. Members installed at the meeting included: *Chairman*, G. A. DiNorscia (Sponge Rubber Products); *Vice-Chairman*, Ward Fisher (Armstrong Rubber); *Secretary*, James Boyle (Armstrong Rubber); *Treasurer*, Harry Gordon (Bond Rubber). The following members were installed as directors of the group: A. Schorr (R. T. Vanderbilt); A. Panagrossi (Connecticut Hard Rubber); Edmund J. Butler (G-E); Lyle Longworth (Monsanto Chemical), and Francis J. Rooney (G-E). The technical portion of the meeting consisted of a film entitled "Behind the Scenes," which was introduced by Richard Zogg, assistant to the president of the Midwest Rubber Reclaiming Co. The movie explained in detail the manufacturing process for rubber reclaim. Following the film, there was a short question-and-answer period directed by Mr. Zogg. The meeting was attended by eighty-five members and guests.

Chicago Group Hears Cain

The February 6th meeting of the Chicago Rubber Group held at the Congress Hotel in Chicago, Ill., was addressed by T. J. Cain of the B. F. Goodrich Co. Mr. Cain delivered an interesting paper on "Safety in the Rubber Plant." The group has announced plans for the March 26th meeting which will be held at the Furniture Mart in Chicago. This meeting will feature a panel discussion on "Test Methods and Test Equipment." Panel members will include R. Barbour (Chicago Rawhide), W. D. Brown (Chrysler), R. S. Schmuckal (Ford), Rolla Taylor (Scott Testers) and William Kohler (Precision Scientific). The March 26th meeting will mark the Silver Jubilee of the group which will use this opportunity to honor the founders. The meeting will also include the presentation of a series of awards to contributors to the welfare of the organization.

Rhode Island Elects Officers

The Rhode Island Rubber Club has announced the election of the following slate of officers for 1954: *Chairman*, F. W. Burger; *Vice-Chairman*, U.J.H. Malo; *Secretary-Treasurer*, R. W. Szulik. Gilbert Enser has been elected to the board of directors for a one-year term, while K. Priestley has been elected for a two-year period. Three, four and five-year terms were voted for H. W. Day, Harry Ebert and Walter Blechareczyk, respectively.

Ricard Trading Co, Formed

Ricard Trading Co., Inc., at 703 58th St., Brooklyn 20, N. Y. has been set up to deal in rubber and plastics. Paul Meyerfeld, president of the firm, has 42 years of experience in these fields. The firm, which also deals in scrap rubber and scrap plastic, has another plant in Brooklyn.

NAMES IN THE NEWS

L. E. HARDWICK, vice-president and sales manager of the Bearfoot Sole Co., has been elected to the board of directors of the company.

JOHN B. HARRIS, JR., formerly associated with the sales offices of the Columbia-Southern Chemical Corp. at Pittsburgh, Penna., has been named sales representative for the Cleveland, Ohio, district office.

LAWRENCE H. HOLDEN, JR., has been appointed sales representative in the Cleveland, Ohio, district office of the Plasticizer Division of the Pittsburgh Coke & Chemical Co.

LAWRENCE D. HARTFORD and ROBERT C. MACKENZIE have been elected sales vice-presidents of the Dunlop Tire & Rubber Corp., with headquarters at Buffalo, N. Y.

WILLIAM CARPENTER has been appointed St. Louis, Mo., district sales manager for the Columbia-Southern Chemical Corp., succeeding BROOKS M. DYER, who has been uamed assistant director of sales for the corporation.

WILLIAM COLE, formerly sales manager of the Fabric Fire Hose Co., has been named vice-president and general manager.

HANS W. ALBU, who has been associated with the Ross & Roberts Co. for the past two years, has joined the Product Development Department of the Permacel Tape Corp. at New Brunswick, N. J.

R. D. WOLFANGEL, formerly associated with the Firestone Tire & Rubber Co., has joined the Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio, as chief chemist.

KENNETH L. MCHUGH, formerly associated with the Evans Research and Development Co., has joined the technical staff of the Connecticut Hard Rubber Co., New Haven, Conn.

DR. WARREN C. LATHROP, associated with Arthur D. Little, Inc., since 1946, has been appointed a vice-president of the company in charge of the Research and Development Division.

H. H. PETERSON, formerly president of Armstrong Motors in Washington, D. C., has been appointed sales supervisor of the Armstrong Rubber Co., West Haven, Conn.

ALBERT M. FIALA, associated with the B. F. Goodrich Co. since 1915, has been named manager of special industrial merchandise for the Industrial Products Sales Department.

R. W. RICHARDSON has been appointed vice-president of the Kelly-Springfield Tire Co., Cumberland, Md., subsidiary of the Goodyear Tire & Rubber Co.

R. W. CRETNEY has been named vice-president and general manager of the Thermatomic Carbon Co., succeeding CLARK BOARDMAN, who has retired after thirty-two years with the company.

Z. C. OSELAND, treasurer of the Goodyear Tire & Rubber Co., has been presented with a lapel service pin marking his completion of twenty-five years' service with the company.

MILTON C. LAUENSTEIN, associated with the General Electric Co. since 1951, has been appointed supervisor of rubber fabricating industry sales development for the Marketing Section of the Silicone Products Department.

L. R. O'ROURKE, formerly sales representative at Chester, Penna., for the Pennsylvania Industrial Chemical Corp., has been appointed New York District Sales Manager for the company.

BOYD E. BRIDGWATER, vice-president and general manager of the Athens Machine Co., a division of the Bridgwater Machine Co., has been named president of the United Fund.

FREDERICK L. PATTON, treasurer of the Cambridge Rubber Co., has been elected national president of the Tax Executives Institute, Inc.

W. F. LANG, formerly associated with the Sponge Rubber Products Co., has been named sales manager of the Foam Rubber and Industrial Sponge Rubber Division of the General Tire & Rubber Co.

C. L. KENNY, with the Quaker Rubber Corp. since 1947, has been named manager of products. In his new capacity, he will coordinate the activities of the factory with those of the sales force.

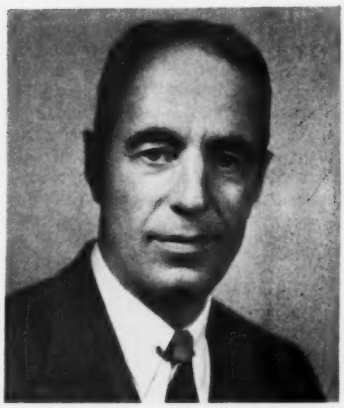
E. WILLIAM EIPPER, formerly associated with the Oronite Chemical Co., has been appointed director of market development for the Western Division of the Stauffer Chemical Co.

WILLIAM J. WORRELL, vice-president and general manager of the Bearfoot Airway Corp., a subsidiary of the Bearfoot Sole Co., has been named "man of the year" by the Akron Junior Chamber of Commerce.

E. A. BOWDITCH, formerly associated with the Armstrong Rubber Co., has been named special eastern representative for latex foam rubber products of the General Tire & Rubber Co.

Emil Hervey Designs, New York, N. Y., is producing a new travel case for shirts with a window made of Bakelite cast vinyl film. Light in weight, the case is ideal for air travel.

Cabot Elects New President



Thomas D. Cabot

The board of directors of Godfrey L. Cabot, Inc., Boston, Mass., have announced the election of Thomas Dudley Cabot as president of the company. Mr. Cabot has served as executive vice-president for a number of years. He succeeds Dr. Godfrey L. Cabot, founder and long-time president of the company. Dr. Cabot will remain chairman of the board. A native and lifelong resident of Massachusetts, Thomas D. Cabot was born in Cambridge. He is a graduate of Harvard University and holds the honorary degree of Doctor of Humane Letters from Tufts College (1951), and the honorary degree of Doctor of Laws from Northeastern University (1952) and from Morris Harvey College (1953). His achievements have been versatile and distinguished, both in public service and as an industrial and financial executive. His name appears as either officer or director on the roster of a considerable number of national industrial and financial organizations.

During World War I, he served as an officer in the U. S. Air Force. In 1950, he was appointed by the President as director for International Security Affairs in the Office of the U. S. Department of State. In October, 1951, he resigned from that office to resume his duties as executive vice-president of the Cabot companies. In January, 1953, he was recalled by the State Department to serve as an industrial consultant to the Technical Cooperation Administration, to advise and assist the Government of Egypt in developing that country's industries under the Point Four program. A former president and director of the United Fruit Co., Mr. Cabot is a director of the First National Bank of Boston and other corporations, including John Hancock Mutual Life Insurance Co. and the American Mutual Liability Insurance Co. He is a member of the Advisory Board of the Massachusetts Investors Trust, of Gas Industries Fund, Inc., and is a life member of the Corporation of the Massachusetts Institute of Technology. He is a trustee of the Boston Five Cents Savings Bank and Radcliffe College and a member of the Board of Overseers of Harvard University. Mr. Cabot also serves as a board member of the National Industrial Conference Board.

exacting performance of tires demanded by

...power speed...

is met by

STATEX·125

the first standard SAF

500 TONS OF SMOKE A DAY

COLUMBIAN CARBON CO. · BINNEY & SMITH INC.

MANUFACTURER DISTRIBUTOR

SAF (Super Abrasion Furnace)

STATEX®-125

◆

HAF (High Abrasion Furnace)

STATEX-R

◆

MPC (Medium Processing Channel)

STANDARD MICRONEX®

◆

EPC (Easy Processing Channel)

MICRONEX W-6

◆

FF (Fine Furnace)

STATEX-B

◆

FEF (Fast Extruding Furnace)

STATEX-M

◆

HMF (High Modulus Furnace)

STATEX-93

◆

SRF (Semi-Reinforcing Furnace)

FURNEX®

COLUMBIAN CARBON CO. • **BINNEY & SMITH CO.**

MANUFACTURER DISTRIBUTOR

NEW POLYMERS AUTHORIZED BY OFFICE OF SYNTHETIC RUBBER, RECONSTRUCTION FINANCE CORPORATION

Listed below are types and properties of new experimental GR-S polymers (including GR-S latices) which have been authorized by the Office of Synthetic Rubber, Reconstruction Finance Corporation, since publication of those in our previous issue. Procedures for the distribution and sale of the polymers will be found in our October, 1945, issue. Normally, experimental polymers will be produced only at the request of the consumers and 20 bales (one bale weighs approximately 75 pounds) of the original run will be set aside if possible for distribution to other interested companies for their evaluation. The 20 bales when available will be distributed in quantities of one or two bales upon request to the Synthetic Rubber Sales Division or will be held for six months after the experimental polymer was produced unless otherwise consigned before that time. Subsequent production runs will be made if sufficient requests are received to warrant them.

X No.	*Polymer Description*	*Remarks*
X-755 GR-S	A masterbatch of 37.5 parts aromatic type processing oil, Socony-Vacuum XT-784-X and 100 parts base polymer—23.5% bound styrene, sugar-free iron activated, 50/50 rosin/fatty acid soap emulsified, 41°F. reaction temperature, 60% conversion, carbamate shortstop, staining antioxidant, salt-acid coagulated. Mean, raw Mooney viscosity of masterbatch 55 ML-4 at 212°F.	Similar to GR-S 1710. Established for a single production run only to permit consumer evaluation so as to obtain their approval as to the interchangeability of the Socony-Vacuum XT-784-X with the aromatic type processing oils already accepted.
X-756 GR-S	A masterbatch of 37.5 parts aromatic type processing oil, Sinclair Extract P-128 and 100 parts base polymer—23.5% bound styrene, sugar-free iron activated, 50/50 rosin/fatty acid soap emulsified, 41°F. reaction temperature, 60% conversion, carbamate shortstop, staining antioxidant, salt-acid coagulated. Mean raw Mooney viscosity of masterbatch 55 ML-4 at 212°F.	Similar to GR-S 1710. Established for a single production run only to permit consumer evaluation so as to obtain their approval as to the interchangeability of the Sinclair Extract P-128 with the aromatic type processing oils already accepted.
X-757 GR-S	A masterbatch of 25 parts aromatic processing oil and 100 parts base polymer—23.5% bound styrene, persulfate catalyzed, fatty acid soap emulsified, 122°F. reaction temperature, 68% conversion, carbamate shortstop, staining antioxidant, salt-acid coagulated. Mean raw Mooney viscosity of masterbatch 48 ML-4 at 212°F.	An oil masterbatch prepared from a high Mooney "hot" GR-S type polymer and an aromatic type processing oil.
X-758 GR-S Latex	Butadiene/styrene charge ratio 70/30 adjusted to yield 25 ± 2.0% bound styrene, sulfoxylate activated, 65/35 rosin/fatty acid soap emulsified, 50°F. reaction temperature, 60% conversion, carbamate shortstop, potassium oleate stabilized. Mean Mooney viscosity of contained polymer 140 ML-4. Latex heat concentrated to 60.0% minimum total solids.	Similar to GR-S X-619 except for the sodium formaldehyde sulfoxylate activation system instead of sugar-free iron which results in a latex with a better color. Has replaced X-619.
	Please Note Changes Made in the Following Experimental Polymer	
X-711 GR-S Latex	Shortstopped with carbamate instead of mercaptobenzothiazole.	

NOTE: The above new polymers are experimental only and the Office of Synthetic Rubber, Reconstruction Finance Corporation, does not make any representation or warranties of any kind, express or implied, as to the specifications or properties of such experimental polymers, or the results to be obtained from their use.

Cycolac Styrene-Type Resin

Marbon Corp., Gary, Ind., has announced the introduction of a new high impact thermoplastic styrene-type resin called "Cycolac". This single uniform resin is of unique composition, and is not a blend of rubbers and conventional thermoplastic resins, the company states. Cycolac is characterized by excellent resistance to impact, high heat-distortion and low brittle-point temperatures, shrink-free calendering and extruding, bright colors, good resistance to chemicals, lightweight, outstanding electrical properties, high gloss and soluble in selected solvents for potential coatings applications. Cycolac is said to be ideal for milling, calendering, extruding, injection-molding and post-forming and should find much use in the manufacture of chemical and industrial piping, molded fittings, profile extrusions, signs, kitchen accessories, machine housings, sporting equipment, electrical fixtures, control gears, ventilating systems, and chemical process equipment. Cycolac as a finished product is hard, light and tough and can easily be solvent-welded or machined, if desired.

Currently Active Polymers

The Office of Synthetic Rubber, Reconstruction Finance Corporation, has issued a new list of currently active experimental polymers. Those experimental polymers not shown here have been discontinued or replaced by permanent polymer numbers. Since these are experimental polymers, their availability at the time of ordering should be ascertained by inquiring of the Sales Division, Office of Synthetic Rubber. Active experimental polymers as of January 31, 1954, follow:

X-617 GR-S Latex
X-633 GR-S Latex
X-667 GR-S Latex
X-684 GR-S Latex
X-710 GR-S Latex
X-711 GR-S Latex
X-734 GR-S Latex
X-753 GR-S Latex
X-758 GR-S Latex
X-754 GR-S
X-757 GR-S

The Office of Synthetic Rubber has also announced that X-733 GR-S has been assigned a standard number, GR-S 1602. X-695 GR-S has also been assigned a permanent number, GR-S 2006.

Can't locate the office copy of RUBBER AGE when you need it? Use the coupon on page 998.

Paisley Introduces Insulam

A self extinguishing fire-resistant laminating adhesive has been developed by Paisley Products, Inc., New York, N. Y., for adhering glass fiber insulation pads and blankets to sheet metal, aluminum foil, fabrics, wallboard and other assembly operations. Called "Insulam," the adhesive is a synthetic rubber-like resin emulsion with quick wet-tack and suction to hold assemblies together until dry. It then becomes a highly water resistant adhesive film that will not support combustion. Thermal limits are high, the bonding strength of assemblies withstanding continuous heat of 375°F. without delamination. Its uses are many and include the adhering of insulation pads to interior walls of gas ranges, oil heaters and similar household appliances; fiber glass batts to air conditioning ducts, coverings to furnace pipes, power piping; boiler lagging operations; laminating assemblies of fiber glass to foil, vinyl films and other non-porous surfaces. The material weighs 9.6 pounds per gallon, is light tan in color and dries with a translucent tough film that remains permanently flexible.

ASTM COMMITTEE D-11 MEETS IN WASHNGTON DURING COMMITTEE WEEK

Committee D-11 on Rubber and Rubber-Like Materials of the American Society for Testing Materials and sixteen subcommittees held meetings in Washington, D. C. on February 3 to 5 during ASTM Committee Week. There was an attendance of approximately 135 members and guests. Action was taken on a number of new specifications and test methods, and plans were initiated for undertaking work on other test procedures.

A comprehensive Glossary of Terms used in the Rubber Industry has just been completed in Committee D-11. The glossary contains over 2000 terms and comprises some 156 single space typed pages. This extensive list of terms has been in preparation for some years by Subcommittee VIII on Nomenclature and Definitions, under the chairmanship of Harry L. Fisher. Members of the committee have been requested to review the glossary for the purpose of offering criticism and suggestions.

Considerable interest has been evidenced in the subject of coated fabrics. Committee D-11 has carried on considerable work on fabrics coated with rubber and rubber-like materials, and all the work on coated fabrics is accordingly to be centered in Committee D-11 with participation on the part of other interested committees, such as Committee D-1 on Paint, Varnish, Lacquer, and Related Products, D-9 on Electrical Insulating Materials, D-13 on Textile Materials, and D-20 on Plastics.

New Subcommittee Organized

A new Subcommittee on Classification and Specification of Rubber Compounds for General Use was organized, in view of the expressed need for specifications for rubber compounds for general applications similar to the ASTM-SAE Specifications for Rubber and Synthetic Rubber Compounds for Automotive and Aeronautical Applications (D 735). The latter have been in use for some years quite successfully in the automotive and aeronautical fields.

The Subcommittee on Insulated Wire and Cable presented for committee letter ballot proposed specifications for insulation compounds based on Butyl rubber and polyethylene. The General Specifications D 27 for insulated wire and cable are being made more concise by elimination of everything but the physical and electrical requirements. Revisions are also being made in the Tentative Methods of Testing Rubber Insulated Wire and Cable (D 470).

The first proposed Specifications for Sheet Rubber Packings were submitted by Subcommittee VI on Packings for publication as tentative. These specifications cover sheet rubber packing or gaskets cut from the same, which are intended for general gasket applications on water, air, and low-pressure steam services. They are not intended for use with oils and strong acids. They include compounds manufactured from natural rubber, reclaimed rubber, and synthetic rubber or mixtures thereof. These new specifications will be a companion standard to the present ASTM-SAE Specifications for Non-Metallic Gasket Materials for General Automotive and Aeronautical Purposes (D 1170).

The Section on Relaxation Testing of Gaskets presented a progress report on its interlaboratory test program. These studies of the relaxation test involve accuracy of strain gage readings, rigidity of jigs, timing of load application, scope and size of specimen, etc.

Physical Testing Activities

The Subcommittee on Physical Testing of Rubber Products presented a revision in the scope of the Tentative Methods of Sample Preparation for Physical Testing of Rubber Products (D 15). This change of the scope concerned those sections of the methods dealing with compounding and mixing of standard compounds utilizing standard ingredients. It was reported that the work on methods for measuring mill roll and stock temperatures being made at the National Bureau of Standards was progressing, and a report should be available at the next meeting. The Buffing Survey Task Group presented some interesting data, and after review by the committee it was decided to continue the round-robin testing, after the procedure has been given a statistical review.

The Subcommittee on Chemical Analysis of Rubber Products presented a revision of the procedures for determination of copper and manganese in crude rubber in the Tentative Methods for Chemical Analysis of Rubber Products (D 297). A revision of the procedure for analysis of ash in D 297 was also recommended. A summary of results of a partial testing program on analysis of carbon black in rubber compounds was given. It now appears to be possible to plan a shorter program involving not more than two methods. A brief discussion of the possibility of enlarging the usefulness of the Tentative Methods of Identification and Quantitative Analysis of Synthetic Elastomers (D 833) by including improved absorption techniques for identification of elastomers resulted in a subcommittee request for consultation with Committee E-13 on Absorption Spectroscopy regarding the best methods of approach to this problem.

Work on Natural Rubber

At the meeting of the Subcommittee on Crude Natural Rubber, there was presented by C. C. Miller, secretary of the Crude Rubber Committee of the Rubber Manufacturers Association, a brief summary of recent work of the RMA Committee. It was voted to set up a task group to study the possibility of developing methods for determining the vulcanization behavior of rubber by means of the Mooney viscometer, with the ultimate view of using data obtained by these means in the classification of crude natural rubber. Considerable discussion took place on the definition of the term "harmful dirt", and it was voted unanimously that it is considered that those particles of dirt in rubber are harmful which do not pass through a No. 325 sieve.

At the meeting of the Subcommittee on Abrasion Tests for Rubber Products, it was reported that the International Committee ISO/TC 45 has approved standards for the determination of tear and abrasion resistance which will be recommended to the Secretariat of the ISO committee for approval by the member countries. The former is based on the crescent-shaped specimen in ASTM Methods D 624 with a single slit, and the latter is based on the DuPont abrader in ASTM Method D 394 using a constant load. Although the proposed abrasion standard is being submitted for approval, weaknesses have been developed in the standard in that the constant torque procedure has been found to give more consistent results with service and the abrasive and standard compound need better standardization.

Difficulties encountered with the abrasize for use with the DuPont and NBS machine in Method D 394 resulted in the subcommittee deciding to circulate a questionnaire to obtain information with respect to the needs and difficulties being encountered. Also the ISO/TC 45 program for standardizing the abrasive for the DuPont machine will be closely followed and the subject will be again considered at the June meeting.

Since the standard compounds in Method D 394 only cover natural rubber, a revision of this standard will be prepared which will include the synthetic rubber-carbon black compounds now in Method D 15. Requirements for control of the air pressure at 40 ± 5 psi for cleaning the abrasive in Method B will also be included.

Test for Tear Resistance

A revision for immediate adoption was recommended in the Standard Methods of Test for Tear Resistance of Vulcanized Rubber (D 624) which will clarify the procedure for measuring the thickness of the specimens in the tear test.

The Subcommittee on Life Test for Rubber Products reviewed at length recommendations pertaining to oven and oxygen bomb aging tests received from ISO/TC 45. Comments will be submitted to the ISO committee. A task group was appointed to determine the possibility of use of a triangular strip for use in sunlight aging. The ambient temperature of artificial weathering machines is being defined as well as a method for measuring it.

The Subcommittee on Hardness, Set, and Creep appointed a task group to study the relationship between the durometer hardness Method D 676 and the ISO method and to consider the possibility or advisability of adopting the ISO standard for hardness of rubber. It was also decided to investigate the effect of 1 second to 30 second readings with the "Wallace hand test instrument" as compared to the "ISO dead weight instrument."

The Subcommittee on Adhesion Tests has in process a round-robin study of the Tentative Methods of Test for Adhesion of Vulcanized Rubber to Metal (D 429) in order to determine the relative merits of certain proposed changes in Method A for testing rubber parts assembled between two parallel metal plates and for Method

B for testing rubber assembled to one metal plate. Study of Method B is to be given preference with one laboratory preparing all assemblies and six laboratories participating in the testing of the prepared samples. Consideration was given to methods for testing rubber-to-metal bonds under dynamic conditions. A summary of dynamic test methods now in use in the industry will be prepared and studied prior to the next meeting.

The Subcommittee on Rubber Cements recommended the addition of an explanatory note in connection with the flow test described in the Tentative Methods of Testing Adhesives for Brake Lining and Other Friction Materials (D 1205) to read as follows: "Percentage of flow is influenced by composition of the material, thickness of the film, and the rate of temperature rise of the oven." A bend test for friction materials bonded to metal was described, including pictures and blue prints of the test equipment which will be written up for consideration at the next meeting. It was suggested that study might be made of the problems of predicting shelf life of neoprene cements to be used in place of the time-consuming aging test now in use. Laboratory test data are being accumulated for evaluation of an impact test and it is hoped that draft of a method may be ready for consideration at the next meeting.

Testing Hard Rubber

The Subcommittee on Hard Rubber has been actively studying an alternative impact test for inclusion in the Tentative Methods of Testing Hard Rubber Products (D 530). In this connection there was presented at the meeting a report on "controllable variables in the ball drop impact test." Study is also being made of an impact test for inclusion in the Tentative Methods of Testing Asphalt Composition Battery Containers (D 639). A report was presented of analytical results on the determination of soluble iron in hard rubber compositions. This proposed method will be given further study by the committee. Action was taken to submit to letter ballot a recommendation to replace the softening point procedure in Method D 430 by the test now included in Method D 648. A report was presented on tests now being conducted on the extensometer method for measuring the "elongation" of hard rubber. Very satisfactory results are being obtained.

The Subcommittee on Low-Temperature Tests submitted a revision in the Tentative Method of Test for Low-Temperature Brittleness of Rubber and Rubber-Like Materials (D 736) in order that it will conform with Specifications D 735 as to testing temperature and also not to limit the method to any specific test temperatures. The revision involves the deletion of the requirement that "Standard test temperatures shall be —40°F. and —70°F." and the substitution of a note to read "Temperatures of —40°F. and —65°F. are commonly used." The temperature-retraction test is now ready for letter ballot in the main committee.

The Subcommittee on Processibility Tests reviewed the progress on the investigation of the new type dies and rotor by the Mooney viscometer in the Tentative Method of Test for Viscosity of Rubber and Rubber-Like Materials by the Shearing Disk Viscometer (D 927) which have been reported upon by the National Bureau of Standards.

The SAE-ASTM Technical Committee on Automotive Rubber presented the following summary of its work and actions taken at the last two meetings held in September and December, 1953:

Section I on Vibration Insulators has completed a round-robin test program to determine the reproducibility of the Tentative Recommended Practice for Classifying Elastomeric Compositions for Resilient Automotive Mountings (D 1207). The data are now being compiled.

Section III on Automotive Hose prepared a revision of the SAE Specifications 40-R3 and also the ASTM Methods D 622 to provide for light duty vacuum brake hose and methods of testing.

Section IV prepared revisions covering Suffix Letter L in the Specifications for Rubber and Synthetic Rubber Compounds for Automotive and Aeronautical Applications (D 735) which have been approved. It has recommended a revision of Suffix Letter K which is to be divided into K_1 adhesion of rubber to metal during vulcanization, and K_2 adhesion of rubber to itself or other material.

Section X on Gaskets is considering some revisions in SAE 9R and ASTM Specification D 1170—51 T. The Section on Oil Seals has recommended that the bench leakage qualification test be changed from 500 hours to 236 hours and this has been approved.

The Section on Finish Standards is making some progress on a system of indicating by means of standard notes on blueprints, the type of finish required for molded and extruded rubber articles. This work is still in progress.

Plastic Hose Sales Soaring

According to the Boston Woven Hose & Rubber Co., the national sales volume of plastic garden hose in 1952 soared beyond $30,000,000, representing more than 250,000,000 feet of garden hose. There are abundant signs, the company states, that the full potential of this market has not as yet been reached as more families take to home gardening.

Pirelli Technical Bulletins

The Pirelli organization, with headquarters at Milan, Italy, is publishing a new series of technical bulletins which are available on request. Published in Italian, Bulletin No. 1, October, 1953, concerns itself with "New Studies in Vulcanization", and covers work which has been done with the T-50 test in finding mathematical formulae for results obtained in checking vulcanization conditions. A summary to the text material is provided in English, German and French.

RUBBER IN LATIN AMERICA SUBJECT OF USDA REPORT

Latin America isn't exhibiting any fears that natural rubber is a dying industry to be superseded in a few years by synthetic production. If anything, the thinking is in the opposite direction—not only will there always be a market for the natural product, but that market will continue to grow. With the synthetic rubber industry in this country about to be turned over to private industry, it appears Latin America plans to give the industry some keen competition.

According to the rubber experts in the Department of Agriculture, interest in rubber planting has increased during the year in Latin America. Government officials and both large and small farm operators have requested added technical assistance. Expansion has been most marked in Guatemala, Brazil, and Peru, with plans for expansion in Mexico and Colombia being definite but somewhat slower in development.

Brazil leads all other Latin American countries in budgetary support of rubber planting and in the acreage of new rubber planted. The Amapa federal territory alone in the Amazon Valley has 150,000 trees growing at stake in the fields and 450,000 trees in nurseries for budding and field planting. This total of 600,000 trees will plant 3,000 acres of rubber. Nursery stocks and field plantings at other locations in the Amazon Valley will make another 1,000 acres. The state of Bahia has nursery stock for planting 1,000 acres and has 200 acres planted with seed at stake, the department stated.

Treading Standard to be Revised

A recommended revision of the Commercial Standard for Treading Automobile and Truck Tires, CS108-43, has just been circulated by the Commodity Standards Division of the U. S. Department of Commerce to producers, distributors and users for acceptance. The existing Commercial Standard, CS108-43, was established in 1943 under wartime conditions. The revision now before the industry for consideration includes requirements that were impractical at that time, and also improvements in the art that have been developed during the past ten years. Mimeographed copies, TS-5197, of this recommended revision may be obtained by addressing a request to H. A. Bonnet, Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Fraser Joins Garlock Packing

On February 15, Donald F. Fraser, for some time past vice-president and general manager of the Rodic Chemical & Rubber Corp. of New Brunswick, N. J., became associated with the Garlock Packing Co. at Palmyra, N. Y. Mr. Fraser will be attached as special assistant to the office of C. R. Hubbard, vice-president in charge of production. His duties will relate primarily to coordination of the various manufacturing and manufacturing-supporting activities.

Thiokol Club Hears Werkenthin

Two hundred members and guests of the Thiokol Technical Club met on February 18, 1954, to hear T. A. Werkenthin, a leading authority on Naval application of elastomers, speak on "Some Elastomer Applications on Naval Vessels." The meeting was held at the headquarters of the Thiokol Chemical Corp. at Trenton, N. J., and was preceded by a social hour and dinner. Mr. Werkenthin, who is head of the Elastomer Branch, Bureau of Ships, Department of the Navy, opened his talk by indicating the wide use of elastomers on Naval vessels. On aircraft carriers, 75,000 pounds is used; on battleships, 50,000 pounds, and on destroyers, 4,300 pounds. The speaker indicated that about 95% of the total consumption is synthetic rubber.

The service conditions that Naval rubber products must withstand were discussed by Mr. Werkenthin. He elaborated on such applications as bearing strips, rubber coatings for shafts and struts, nonslip deck covering, deck caulking materials, gaskets, rubber gloves, fuel suction and discharge hose, steam hose, airflex clutches and submarine battery compartment linings. In the course of his discussion, Mr. Werkenthin mentioned several interesting applications for "Thiokol" Liquid Polymer. He discussed the use of this material in caulking wooden decks and hose cover repair and the results obtained with these elastomers.

Davis Files For New Trial

Attorneys for Poncet Davis, president of the Robbins Tire & Rubber Co. of Tuscumbia, Ala., who was convicted recently of evading $738,000 in income taxes, have filed motions for a new trial in Federal Court, Cleveland, Ohio. Mr. Davis was convicted on four counts and was sentenced to four concurrent sentences of five years each in Federal prison. He also was fined a total of $40,000. His attorneys now claim that the Federal Judge hearing the trial erred 25 times in making rulings during the case. It has also been announced that the $10,000 in bail posted by Mr. Davis during his trial will be applied to his tax shortages. That leaves the court in possession of $20,000 in bail money. The original $10,000 was put up by Robbins Tire, while the remaining $20,000 was advanced after Mr. Davis' conviction.

Builds Latex Polymer Plant

Union Bay State Chemical Co. of Cambridge, Mass., has announced the completion of a new plant for the production of latex polymers. The plant was designed to manufacture the newly-developed "Ubatol" series of polymer emulsions for the paint, paper, textile, floor wax or finish, and leather finishing industries. Safety precautions at the new plant include explosion-proof motors and wiring, and rupture discs on all reactors to dissipate any excess pressure. In the processing of the latex polymer, all ingredients are quality tested and quantitatively measured in loading the reactors.

Rodney Hunt Promotes Coston

Malcolm M. Coston

Malcolm M. Coston has been appointed manager of the Process Equipment Division of the Rodney Hunt Machine Co., Orange, Mass. He will be responsible for sales and development of the patented "Turba-Film" evaporator and the Rodney Hunt "Luwa Spray Dryer". Mr. Coston was formerly district chemical engineer for 12 years at Philadelphia and other points for the Swenson Evaporator Division of the Whiting Corp. He is widely acquainted in the chemical industry. He is a graduate of Alfred University and the University of Michigan with B. S. Ch. E. and M. S. Ch. E. degrees, and is a member of the American Institute of Chemical Engineers.

New White-Wall Tire Spray

Farbach Chemical Co., Cincinnati, Ohio, has announced a new type of white-wall tire spray. The product is designed to quickly remove all grease and ground-in dirt from the tire without rubbing. The spray contains a special grease solvent coupled with a number of fast cleaning agents that enable the user to merely spray the tires, then rinse with a hose. The company says the product will clean four tires in four minutes. "White-Wall Spray," as it is called, is completely soluble in both hard and soft water, thus leaving no sticky residue to attract dust and dirt. The product is non-toxic and is guaranteed harmless to any white side-wall tire.

Forms Rubber Research Section

Laboratory facilities of the Chemical Division of Armour and Co., Chicago, Ill., have been expanded to include a Rubber Research Section. This addition is the result of increasing use of the company's fatty acids and fat-derived chemicals by the rubber industry. The new rubber research group, under the supervision of S. N. Pinhasik, will concentrate on the development of new applications for fatty acids and their derivatives in all types of rubber and plastic. Equally important will be the search for new products for these industries.

Wingfoot Bicycle Tire

A new bike tire of almost revolutionary design, combining the sturdiness of balloon tires with pedaling ease inherent in the popular lightweight units, has been announced by the Goodyear Tire & Rubber Co., Akron, Ohio. Known as the "Wingfoot," the tire is of a new cross-section size (1.75), halfway between the conventional 2.125 balloon and the 1.375 lightweight cross sections. The new tire is designed for the latest streamlined bicycles, but may also be used on older models. The Wingfoot will fit any standard 2.125 rim, the company states, including rims on all existing 20, 24 and 26-inch bicycles. Described as "a tire of premium quality," the new product costs little more than the standard balloon tire, it is pointed out. Minimum rolling resistance, smooth ride, a still safer tread and long wear are some of the Wingfoot's outstanding characteristics, according to Goodyear. Tread, sidewall and fabric of the new tire are similar to those of the company's lightweight tires, it is explained, thus assuring ease of pedaling. Yet the new tire has the sturdiness and cushioning action so desirable in balthe new tire added style and attractiveness. The sidewalls also have a scuff rib for loon tires. Narrow, white sidewalls give protection. Manufactured in three sizes, 20 x 1.75, 24 x 1.75 and 26 x 1.75, the tire is immediately available.

Invention Exhibit Planned

The nation's inventors will have an opportunity to make a bid for a profitable recognition of their "brain children" at an Invention Exhibit and Conference to be held on May 3 at the Cleveland Engineering Society, Cleveland, Ohio. Prompted by the lack of a common meeting ground where inventors and industrial leaders can get together, the organization is sponsoring the exhibit and conference as a mutual service and to stimulate invention. In addition to an exhibit of operating and nonoperating units or models which are available for leasing, licensing or sale, an afternoon and evening program of informational talks on inventions will be given. The conference will be headed by Joseph H. Gepfert (Reeves Pulley) as general chairman.

DuPont Files Anti-Trust Briefs

The last phase prior to the decision in the government's historic anti-trust case against E. I. du Pont de Nemours & Co., Inc. and other large corporations and members of the du Pont family was completed on February 25. Both DuPont interests and Federal attorneys filed reply briefs with Federal District Judge Walter J. Labuy. A renewed plea for dismissal of the government's complaint was made in a brief filed on behalf of the DuPont company, two leading members of the family and the Christiana Securities Co. The government asked that its proposed findings of fact be accepted by the court.

Need a personal file of RUBBER AGE? Use the coupon on page 998.

Seymour Appointment Announced

Dr. R. B. Seymour

Dr. Raymond B. Seymour, formerly executive vice-president and a member of the board of directors of the Atlas Mineral Products Co., Mertztown, Penna., has been appointed president of the company succeeding George L. Wirtz, who was recently promoted to chairman of the board. Dr. Seymour, the originator of furan cements and many other products of the Atlas line, joined the company as chief chemist in 1939. A native of Boston, Mass., he received his B.S. and M.S. degrees from the University of New Hampshire and his Ph. D. degree from the University of Iowa. After serving as a graduate assistant at both schools, he joined the Goodyear Tire & Rubber Co. as a plastic research chemist. He has also been a research group leader at the Monsanto Chemical Co., a director of the Industrial Research Institute of the University of Chattanooga and director of special products research for Johnson & Johnson. He is the author of approximately fifty patents and more than one hundred technical publications, primarily on plastics as materials of construction. He is a member of over thirty technical societies. The company's principal products are plastic cements, joining materials, linings, coatings, adhesives, plastic pipe, fittings and fabricated structures.

INIRO Conference Papers

The Indonesian Rubber Research Institute, Bogor, Indonesia, has published a compilation of the papers presented at the Conference of the Rubber Research Institutes in the Far East which was held in Bogor on July 15 through 17, 1952. The conference was held under the auspices of INIRO, the Central Experiment Stations Organization and the General Organization of Rubbers Planters in East Sumatra. This publication contains the papers delivered at the Chemical Technological Section, including the discussions. The papers and the discussions are published in both French and English, as Special Number 2 of *Archief voor de Rubbercultuur*, October, 1953. Copies of the publication may be obtained from INIRO at Bogor.

Join Rubber and Asbestos

The appointment of George B. Stanton Jr., and Charles L. Stachel as technical sales representatives has been announced by the Rubber and Asbestos Corp., Bloomfield, N. J. Mr. Stanton was formerly chief chemist of the Arvey Corp., Jersey City, N. J. where he has specialized in adhesives research and development work for the past five years. He is a graduate of Brooklyn Polytechnic Institute and did graduate work in the Institute of Polymer Chemistry where he received his degree of master of chemical engineering. Mr. Stanton is a member of the American Chemical Society; American Institute of Chemical Engineers; Society for the Advancement of Management; Technical Association of the Pulp and Paper Industry; and the Armed Forces Chemical Association.

For the past eleven years, Mr. Stachel has been associated with the Adhesives Development Staff of the Mechanical Goods Division of U. S. Rubber Co. Prior to that time, he was with the Adhesives Division of the Borden Co. He is a member of the Rubber and Plastics Section of the American Chemical Society. Mr. Stachel's headquarters, it was announced, will be in Fort Wayne, Indiana, in keeping with Rubber and Asbestos' expanded adhesives service program for midwestern industry.

Rare Metal Incorporates

Rare Metal Products Co., Atglen, Penna. has announced that it has incorporated under the laws of the Commonwealth of Pennsylvania and has acquired all of the real estate, personal assets, goodwill, trade marks, etc., of the Rare Metal Products Co., Atglen, Penna. (a New Jersey corporation). The new company will continue to supply the highest quality golden and crimson antimony to the rubber trade. Norman R. Wilson has been elected president and general manager and Vernon Kennel has been elected secretary-treasurer of the new company. Mr. Wilson had been associated with the late David A. Shirk, founder of the Rare Metal Products Co., in research and development since 1919 and has been general manager since the company moved to Atglen in 1946. Mr. Kennel has been secretary-treasurer of the Rare Metal Products Co. since 1946.

Enters Polyethylene Field

Koppers Co., Inc., plans to enter the polyethylene field and will construct a new chemical plant for production of the nonrigid plastic. Koppers said it will produce the plastic in pelletized form for sale to molders and extruders, in a variety of grades for all typical uses. Construction of the plant is expected to start this spring, with operation scheduled to begin the middle of next year. The company said it is considering several plant sites, including Port Arthur, Texas, where a plant for the production of chemicals was placed in full operation less than a year ago. Production of the new material will supplement the company's present operations in the plastic industry. It now produces polystyrene.

Cyanamid Promotes Wellman

V. E. Wellman

Appointment of V. E. Wellman as Manager of the Petrochemicals and the Intermediate and Rubber Chemicals Departments was announced recently by the Organic Chemicals Division of the American Cyanamid Co. Dr. Wellman, prior to his new appointment, was assistant manager of the Intermediate and Rubber Chemicals Department. He joined the former Calco Chemical Division, American Cyanamid Co. in 1945 as associate director of process development and in 1951 became director of process engineering. He was formerly director of purchases for the Chemical Division, B. F. Goodrich Co. and assistant sales manager of the Solvents Department of the R. W. Greeff Co., New York, N. Y. He attended Phillips University and the University of Washington where he received his Ph.D. in chemistry in 1929. Dr. Wellman is a graduate of the Advanced Management Program of the Graduate School of Business Administration, Harvard University. He is a member of the American Chemical Society, American Institute of Chemical Engineers, Commercial Chemical Development Association and the Chemists' Club of New York.

International Latex Expanding

International Latex Corp., Dover, Del., is starting a $4,000,000 expansion program according to a recent announcement by A. N. Spanel, chairman of the board. The expansion embraces the use of Southern plants, not only in the production of latex articles, but also for cut and sewing operations. The first southern plant will be located in Newnan, Ga. It comprises about 35,000 square feet in a factory that was formerly used by Johnson and Johnson. International Latex is now modernizing and air conditioning the plant preparatory to setting up its latex and sewing operations. In the latter part of 1953, the company completed its factory at Arnprior, Ont., Canada. It is, in essence, a replica of the same operation built in Dover in 1937. The new plant is a wholly-owned subsidiary of the parent company. The Canadian plant and the new Southern operations will function on the same profit-sharing plan that exists at Dover.

Develops Anti-Skid Treads

Motorists driving on retreaded tires can now get skid protection and traction equal to or better than many new tires through a new method of processing tread rubber developed by the U. S. Rubber Co. U. S. Rubber calls its new patented process "pre-de-skidding" which is a method of putting skid resistance and traction into the rubber at the factory—before it is shipped to the tire rebuilder's shop. Standard types of tread rubber are manufactured with a smooth tread surface. U. S. Rubber presses a deep-cut basket-weave design into the surface of the uncured rubber with a specially developed wheel having a series of heated teeth. The rubber is shipped to the tire rebuilder with this design permanently pre-cut into it. When the tire rebuilder places this camelback into his tire mold, the basket-weave design gives his completed tire tread thousands of additional gripping edges on the road surface. They quickly respond to either brake or accelerator pedal for extra stopping power or traction. Surface traction is 30% greater with the new tread rubber than with the other retreads in wide use today, and there is no reduction in tread mileage, the company states. The new material can be used with any tread design, requires no new equipment or special handling, and is uniform in service, appearance and performance.

PR-395-HT Base Compound

Products Research Co., Los Angeles, Calif., has introduced "PR-395-HT", a new Thiokol base compound that is said to offer excellent qualities as both a sealer and expansion joint. Particularly important uses for the compound have been found in concrete repair work, as well as original construction. It is generally recommended for use wherever expansion, contraction or vibration requires joint resilence, by itself, or in conjunction with a water seal. The material is used with "PR-1090 Primer" and achieves an unusually strong bond to most materials. Application of PR-395-HT is done with a spatula or extrusion gun. It has a thixotropic consistency and will hold its position on vertical and overhead installations. A companion product, "PR-395," of lower viscosity, is available for pouring into floor and other horizontal type joints.

Building Research Laboratory

A new pigment colors research laboratory will be built by E. I. du Pont de Nemours & Co., Inc., at its Newark, N. J. pigments plant, the company recently announced. The laboratory will be among the most modern of its kind in the country for scientific studies leading to the development of new colors for paint, lacquers, automobile finishes, ink, paper, plastics and other products, it was said. A colors research program, now being conducted at several locations at the plant, will be consolidated in the new building where members of the research staff also will have their offices. Dr. J. Nelson Tully, laboratory director, said ground is expected to be broken for the two-story brick structure about April 1.

Been Named Vice-President

Jerome Been

Rubber & Asbestos Corp. of Bloomfield, N. J. has announced the promotion of their technical director, Jerome Been, to the position of vice-president. Mr. Been joined the company in 1946 after extensive technical experience in allied industries with such organizations as Ansbacher-Siegle Corp., Angle-Chilean Nitrate Corp., and the Technical Division of U. S. Maritime Commission. Mr. Been, whose graduate study was with George Washington University and the Brooklyn Polytechnic Institute, is a member of the Division of Rubber Chemistry, the American Chemical Society, and the New York Rubber Group.

Votes to Continue Library

The Steering Committee of the Division of Rubber Chemistry, American Chemical Society, met in New York City on January 22 to discuss problems which have arisen with respect to the Rubber Division Library maintained at the University of Akron. At the meeting, the committee, by unanimous vote, rescinded the action taken by the Executive Committee of the Rubber Division at Chicago, Ill., in September, 1953, to discontinue the sponsorship of the library on March 1, 1954. The Steering Committee unanimously voted to continue the sponsorship of the library by the Rubber Division until August 1, 1954, because sufficient funds to carry the library to that time are currently available.

1954 TLARGI Yearbook

The Los Angeles Rubber Group, Inc., with headquarters at the Hotel Statler in Los Angeles, Calif., has released Volume XIII of its publication, the "TLARGI 1954 Yearbook." As usual, the yearbook offers a compilation of group activities throughout the preceding year, including a resume of all technical meetings. Suppliers to the rubber industry in the Los Angeles area are listed as are rubber manufacturers in the area. Also included is a list of members of the Los Angeles Rubber Group. Copies may be obtained by writing the Chairman, Yearbook Committee, Los Angeles Rubber Group, Inc., Statler Hotel, Los Angeles, Calif.

Blow Joins Precision Rubbers

Dr. Claude M. Blow, well-known English scientist, who since last May has been in charge of the Rubber Section of the Ministry of Supply's Advisory Service on Plastics and Rubber, has resigned to join Precision Rubbers, Ltd., Bagworth, Leicestershire, England, as technical director. In his new position he will be in charge of the company's laboratories both as regards research and development and factory control. During his career, Dr. Blow carried out academic work on rubber latex at University College and the Northern Polytechnic and was research chemist with the John Bull Rubber Co. from 1933 to 1936. He then joined the Rubber Growers' Association to work on the rubberizing of wool. He developed and patented "Positex" a positively charged latex which deposits on a negatively charged woolen fiber. In recent years, this development has had considerable commercial success. After a period with the Rubber Producers' Research Association, Dr. Blow rejoined John Bull Rubber. In 1947 he returned to BRPRA as head of the Technological Department and at the end of 1950 was appointed head of Rubber Technical Developments, Ltd. Dr. Blow left RTD to join the Ministry of Supply in the early part of last year.

Goodrich Chemical Hycar 1041

B. F. Goodrich Chemical Co., Cleveland, Ohio, has announced the development of "Hycar 1041", a new, cold polymerized, high nitrile Hycar rubber with improved physical properties and processing characteristics. The new product is similar to Hycar 1011 in composition but has even better stress-strain properties and oil resistance. The company states that the very low viscosity of Hycar 1041 solutions should be of particular interest to cement manufacturers. Hycar 1041 solutions with workable viscosities can be prepared without milling. Upon being cured for 15 minutes at 310°F., the product exhibits an ultimate tensile strength of 2500 psi and modulus at 300% elongation of 1750 psi. Ultimate elongation of the product is 490% while the Durometer A hardness is 66.

Brazilian Plant In Production

The new plant of the Dunlop Rubber Co. in Campinas, Sao Paulo, Brazil, produced its first tire early in January, made entirely from Brazilian raw materials. Construction of the factory was begun on February 23, 1952. The new Brazilian tire plant, covering a floor space of nearly 300,000 square feet, is built in the most up-to-date industrial style, and is said to contain "the last word" in modern tire making machinery. Brazil's output of natural rubber, hard-pushed by its expansion of the rubber industry, is being sharply boosted. Output of nylon cord for tire making, particularly in the State of Sao Paulo, is also being intensified.

Another copy of RUBBER AGE needed in your office? Use the coupon on page 998.

Heads New Development Division

William M. Bergin

American Hard Rubber Co., New York, N. Y. has announced the appointment of William M. Bergin to head its newly formed Development Division. The new division, established as a major department of the company, will originate and facilitate the development of new and old products and materials. Mr. Bergin will integrate the functions of research, engineering and product development. Victor T. Norton, president of American Hard Rubber, in making the announcement said, "Combining these formerly separated functions into one division under Mr. Bergin will result in stepping up the production and marketing of new as well as old products and will provide much greater efficiency of operation". Mr. Bergin was formerly chief engineer of the Kaylo Division of Owens-Illinois Glass Co. with whom he was associated for 22 years. A native of Toledo, Ohio, Mr. Bergin, attended the University of Michigan and Harvard Business School.

AICE Plans May Meeting

The Spring National Meeting of the American Institute of Chemical Engineers will be held in Springfield, Mass., on May 16 to 19. Included in the program will be a forum on "Training Technical Men in Industry", and Symposia on "Polymeric Materials of Construction", "Cost Control", and "Process Design". There will also be general technical sessions.

Forms Plastics Sales Group

Formation of a Plastic Sales Group by the Hooker Electrochemical Co., Niagara Falls, N. Y., was recently announced. This new group will be headed by Charles Y. Cain, who has been promoted to manager of plastic sales. Mr. Cain has been with the company since 1940. The new group will handle sales of Hooker's new fire-resistant polyester resin named "Hetron".

Need a personal file of RUBBER AGE? Use the coupon on page 998.

NEWS IN BRIEF

Dewey & Almy Chemical Co., Cambridge, Mass., has made available a new technical bulletin on its Darex High Styrene Copolymers. Bulletin C-14 is entitled "A Guide to Varying Physical Properties in High Gravity Sole Compounds."

Cratex Manufacturing Co., San Francisco, Calif., has published a new catalog on the adaptability and application of rubberized abrasives. Ask for Catalog No. 53.

"Sterling SO for Dimensional Stability of Uncured Butyl Tubes" is the title of a new technical bulletin, No. GD-7, issued by Godfrey L. Cabot, Inc., Cambridge, Mass.

Arthur D. Little, Inc., has announced the opening of a new west coast office at 114 Sansome Street, San Francisco 4, Calif.

Goodyear's leading role in the nationwide campaign for better roads has been recognized by the American Trucking Association, Inc., through the presentation of ATA's special citation for service.

"Basketball Techniques", a new 16-mm sound film in black and white, with practice and game demonstrations by the nine leading pro-basketball teams in the country, is being released jointly by the U. S. Rubber Co. and the National Basketball Association for use by college, high school and sports groups.

Arrangements for the largest single purchase of Airfoam ever made by one furniture manufacturer have been completed by the Luxury Furniture Co. through Stephenson and Lawyer, Inc., Airfoam distributors for Goodyear at Grand Rapids, Mich.

To Head Colombian Plant

Sam I. Roudebush has been named resident plant manager of a new tire manufacturing plant being built in Bogota, Colombia by the Seiberling Rubber Co. and a group of Colombian investors. Mr. Roudebush's appointment was announced jointly in Akron and Bogota by Octavio Villegas Llano, general manager of Productos de Caucho Villegas, S. A., the Colombian rubber company which will be affiliated with Seiberling in the new venture, and J. P. Seiberling, president of the American company. Mr. Roudebush, who joined Seiberling a year ago as assistant manager of tire design, is no stranger to Colombia. He spent more than three years in Bogota as technical advisor for the B. F. Goodrich Co. and returned to the United States less than 18 months ago. A native of Trinidad, Colo., Mr. Roudebush attended the Colorado School of Mines. He worked as a civil and mechanical engineer in the railroad and steel fabricating fields for five years, and for the last seven years has been in technical and development work in the rubber industry. Mr. Roudebush is a registered professional engineer and a member of the American Society of Mechanical Engineers.

Appointed Director of Sales

Bancroft W. Henderson

The Organic Chemicals Division of the American Cyanamid Co. has announced the appointment of Bancroft W. Henderson as director of sales. Following a recent announcement of the reorganization of Cyanamid's divisional structure, the Organic Chemicals Division has been formed to embrace the development, production and sales of the products of the former Dyestuff, Textile Resin, Intermediate and Rubber Chemicals, and Explosives Departments of the Calco Chemical Division, and Petrochemicals Division of the company. Mr. Henderson was formerly manager of the Intermediate and Rubber Chemicals Department of the Calco Chemical Division. He joined American Cyanamid as manager of the Crude Rubber Department and following American Cyanamid's entry into the rubber chemicals field in 1935, he became manager of the new department. Under his direction, the company has become a leading supplier of rubber chemicals to the rubber industry. Mr. Henderson is an associate member of the American Chemical Society.

Publishes Goodyear Lecture

Simplex Wire & Cable Co., Cambridge, Mass., has made available in booklet form the 1953 Goodyear Medal Lecture delivered by Dr. John T. Blake at the September 10, 1953, meeting of the Division of Rubber Chemistry of the American Chemical Society in Chicago, Ill. Dr. Blake's talk was entitled, "The Future of Rubber". He is director of research for Simplex Wire.

Neville Chemical Appointments

E. Glenn Isenberg has been appointed sales manager of the Neville Chemical Co., Pittsburgh, Penna. effective immediately. Mr. Isenberg joined Neville in 1936 and had been assistant sales manager. R. M. Lauderbaugh has been appointed advertising manager and retains his current position as export sales manager. Mr. Lauderbaugh has been with Neville Chemical since 1941.

FINANCIAL NEWS

U.S. RUBBER 1953 NET PROFIT SETS A NEW RECORD FOR FIRM

Net profit of the U.S. Rubber Co. increased 16% in 1953 to set a new record of $32,732,300, compared with $28,169,955 in 1952, according to the company's annual report released for publication by H. E. Humphreys, Jr., chairman of the board. Net sales totaled $838,451,068, 1% lower than 1952 sales of $850,151,566. Normal peacetime business was $22,000,000 higher than the year before, but defense business was $34,000,000 lower. Profit was 3.9% of sales and amounted to $5.19 a share of common stock, compared with 3.3% of sales and $4.33 a share in 1952.

The larger profit resulted from increased income from sources other than sales and unusually large tax and other adjustments, Mr. Humphreys explained. Previous reserves for income taxes and renegotiation proved to be larger than necessary. Furthermore, agreement was reached as to the recovery value of the company's Far Eastern rubber plantations for income tax purposes. These were lost to the enemy in 1942 and were put back on the books in 1946 and 1948 on a tentative basis.

Also, Mr. Humphreys said the company was able to bring cash into the United States representing earnings of the rubber plantations in previous years. These earnings had been held abroad by exchange restrictions.

The company's profit from the sale of products, before taxes, was $70,000,000 in 1953, compared with $90,000,000 in 1952. The drop was caused by lower sales volume, increased wages and salaries, increased cost of employee benefits and the increased cost of greater selling effort, the report stated. It said such costs included certain non-recurring items totaling approximately $4,000,000.

After deducting adjustments for previous years, provision for Federal and foreign income taxes and renegotiation of defense business was $39,883,436, compared with $60,384,335 in 1952.

During the year, $26,000,000 were invested in modernization and expansion projects, the same as in 1952. A new foam rubber plant was started on the West Coast. Various projects were completed to expand production of plastics, Paracril synthetic rubber and agricultural chemicals. A number of textile mills were modernized or expanded.

Long term debt at the end of the year stood at $120,896,000, compared with $102,719,000 a year earlier. During the year, the company borrowed the balance of $25,000,000 available under the loan of $50,000,000 negotiated with three insurance companies in 1952. It purchased $6,823,000 par value of its 2¾% debentures due in 1967, to use for future sinking fund payments.

Current assets at the year-end were $359,597,174, compared with $361,757,637 at the close of 1952. Current liabilities were $128,340,940, compared with $155,521,338. Thus the current ratio increased from 2.3 to 2.8. Net worth a share of common stock increased from $26.36 to $29.55.

The company's International Division continued to face severe competition and exports were affected by dollar shortages abroad. To provide larger overseas sources of merchandise, the company acquired full ownership of the plant in Venezuela in which it formerly had a 50% interest. Facilities there will be expanded to produce tires and tubes. The company's affiliated plant in Colombia is being expanded to make tires, tubes and plastics.

"The year 1954 will be a year of harder selling and keen competition," Mr. Humphreys said, "but any decline in sales which might develop from adjustments in our national economy should not be substantial. Elimination of the excess profits tax will have an important offsetting influence on net income.

"Our nation's economy is dynamic. Population is growing rapidly and the trend is expected to continue. The amount of rubber consumed per capita in the U. S. A. continues to increase. We look for a 30% increase in rubber consumption within 10 years.

"Whatever set-back there may be in 1954 should be only a slight pause in our nation's steady advance. We expect to do our part in stimulating and satisfying the ever-increasing demands of our customers, old and new."

GOODYEAR SALES IN 1953 HIT NEW ALL-TIME COMPANY RECORD

For the third year in a row, sales of the Goodyear Tire & Rubber Co. exceeded the billion dollar mark in 1953 to reach an all-time high of $1,210,508,783, P. W. Litchfield, chairman of the board, announced recently. Net earnings also established a new high record for the third consecutive year. Consolidated net income of $49,323,167 was equivalent to $10.28 a share on common stock now outstanding, including shares issued as a stock dividend during the year. This represented an increase of 26.4% over 1952 net income of $39,009,866, equal to $8.00 per share on the same number of shares. Last year's record sales were 6.3% ahead of the previous high mark of $1,138,403,608 set in 1952. Income per dollar of sales improved to 4.1 per cent against 3.4 per cent in the previous year.

"Goodyear plants, both domestic and abroad, were substantially enlarged to meet customers' requirements, with the result that 1953 was an all-time high in units and tonnage, as well as in dollar sales and consolidated net earnings," according to Mr. Litchfield.

"With the large increase in the number of passenger cars and trucks now on the roads, we anticipate a growing business in replacement tire sales, although there may be a decline in new car production during the current year."

Although Goodyear's capital expenditures for properties and plants exceeded $50,000,000, working capital at the year-end increased to $401,465,369 compared with $397,200,805 the year before. The current asset ratio rose to 7.4 to 1 compared with 5.8 to 1 at the end of 1952.

Income of Goodyear's foreign subsidiaries in 1953 amounted to $21,677,603. Dividends totaling $11,525,059 were received from these subsidiaries during the year, the remaining earnings being invested in plants and equipment or added to their working capital. During this period, several foreign currencies—notably that of Brazil—were devalued and the reserve for foreign investments, provided for this contingency in prior years, was utilized to the extent of $6,220,500 to adjust net equity book values outside of the United States to the lower rates of exchange. In addition, $1,221,000 of restricted foreign earnings have been excluded from income of the year and carried to the reserve for foreign investments.

Goodyear's output of products for military requirements was substantially increased during the year in many lines, primarily in the transportation and aviation fields.

The company's business outside the United States continues to expand, Mr. Litchfield pointed out. Goodyear now has twenty-four overseas plants in seventeen foreign lands, and distributors in all countries outside the Iron Curtain.

Commenting on the rubber supply situation, Mr. Litchfield said: "The uncertain political and economic situation in the Far East, and the long period required to bring new planting to maturity, hold little promise of increase in the nearby world supply of tree rubber. Therefore, increasing needs must be anticipated by forward planning to provide adequate synthetic rubber production capacity to meet this demand. Congress has authorized transfer of the present Government-owned synthetic rubber plants to private ownership.

"Our company's rubber plantations in Sumatra have been supplying an ever increasing proportion of our requirements. We see no reason why an efficient, steadily operated natural rubber plantation cannot continue to prosper against synthetic competition. The world-wide consumption of rubber products continues to increase."

Parker Appliance Co.

Six Months to December 31: Net income of $531,523, which is equal to $1.37 a share, compared with $498,932, or $1.28 a share, in the last six months of the previous year. Sales in the last half of 1953 totaled $12,127,548, against $11,040,530 in the six months ended December 31, 1952.

Michigan Chemical Corp.

For 1953: Net loss of $140,053, which is equal to a net loss of 26c a share, compared with earnings of 48c a share in 1952 on the 537,077 shares outstanding. Sales and operating revenues in 1953 amounted to $5,711,396 against $6,800,796 in 1952.

1953 SALES OF $205,371,098 SET NEW GENERAL TIRE RECORD

Sales of the General Tire & Rubber Co. for the year ending November 30, 1953, reached an all-time record high of $205,371,098, president William O'Neil announced recently in his stockholders report. This is an increase of $19,456,851, or a 10.4% rise over the previous record high set in 1952. Profits after taxes were $7,431,802, including an unconsolidated $1,156,644 as General's share of its radio and television subsidiary, the General Teleradio, Inc.

The improvement in the profit picture amounts to 3.9% over last year and represents an earning of $5.87 per share of common stock. Sales of the radio and television subsidiary, or of General's foreign subsidiaries or affiliated companies excepting Canada, are not included in General's record-setting consolidated figures.

The ratio of current assets to current liabilities is 2.25 to 1, an improvement over last year. General's current assets amount to $80,525,508 and current liabilities were $35,812,820. General's working capital was increased $6,522,828 over a year ago. As of November 30, 1953, its net working capital was $44,712,686 as compared with $38,189,856 the previous year.

During 1953, General continued to pay dividends on common stock at the rate of $2.00 per share, and at the end of the fiscal year was ahead of the redemption requirements on its 4¼% preferred series by more than three years and by more than five years on its 3¾% series, Mr. O'Neil reported to his stockholders.

"Our over-all 1954 outlook is encouraging, as it is for the entire rubber industry," Mr. O'Neil pointed out. "This is true despite the anticipated decline in automobile production. Travel will reach an all-time mileage record and the trucking industry, despite unwise legislation, will transport even greater volumes of the nation's freight."

General expects to put its new $6,000,000 polyvinyl chloride resin plant in Ashtabula into operation by mid-1954, and also expects its new factories in Amsterdam, Holland, and Rio de Janeiro, Brazil, to begin full-scale production in the next several months.

"The proceeds of the sale of our stock in the Mansfield Tire & Rubber Company provided a substantial part of the financing for our Ashtabula plant," Mr. O'Neil reported. "Both our plastic and chemical divisions, despite limited facilities, made big gains last year in sales and profits."

General recently announced negotiations for the acquisition of the Textileather Corp. of Toledo, and the Bolta Co. interests, of Lawrence, Mass., and it is expected the merger proposals will be submitted to the General stockholders at their annual meeting, April 6.

Mr. O'Neil reported that the merger of Aerojet-Engineering into the Crosley Motors to form the subsidiary, Aerojet-General Corporation, had achieved the anticipated satisfactory results. "The move further solidified Aerojet-General's position as the world's largest commercial developer and manufacturer of rocket engines, rocket proponents and rocket propellants," he added.

"Our Industrial Products Division and our radio and television subsidiary eclipsed 1952's records. While the industry as a whole suffered a decline in radio time sold, our subsidiary enjoyed a 10 percent gain in the time sold. Also, it now has 17 of the nation's largest 25 advertisers," the General president said.

Flintkote Company

For 1953: Net income of $5,032,116, which is equal to $3.73 a share, compared with $4,896,737, or $3.61 a share, in 1952. Net sales in 1953 amounted to $90,250,816, against $84,039,381 in 1952.

United Carbon Co.

For 1953: Net income of $3,886,558, which is equal to $4.88 a share, compared with $3,597,739, or $4.52 at share, in 1952. Net sales in 1953 amounted to $34,369,254, against $30,624,244 in the previous year.

Brown Rubber Co.

Quarter Ended December 31: Net income of $1,216,591, which is equal to $1.87 a common share, compared with $1,087,561, or $1.67 a share in the comparable quarter of the preceding year.

National Automotive Fibres

For 1953: Net income of $3,231,040, which is equal to $3.24 a share, compared with $2,053,346, or $2.06 a share in 1952. Sales in 1953 totaled $90,609,934, against $73,573,521 in the previous year.

Rome Cable Corp.

Nine Months to December 31: Net profit of $1,259,000, which is equal to $2.52 a common share, compared with $1,550,000, or $3.17 a share, in the nine months ended December 31, 1952.

Take a long time for this copy of RUBBER AGE to reach your desk? Use the coupon on page 998.

GOODRICH SALES IN 1953 SET NEW ALL-TIME COMPANY RECORD

Increase of 8.1% in the sales of the B. F. Goodrich Co. from 1952 was shown in the company's report to stockholders for the year 1953, John L. Collyer, chairman and president, reported recently. Net sales reached an all-time high amounting to $674,613,276 compared with $624,102,207 in 1952. After providing for all costs, including taxes and depreciation, and after a reserve of $2,000,000 for increased replacement cost of facilities, net income amounted to $34,226,745, or $8.16 a share on the 4,194,250 shares of common stock outstanding at year end.

The corresponding net income for 1952, after a reserve of $2,000,000 for increased replacement cost of facilities, was $32,364,008, which, after deducting dividends paid on the preferred shares then outstanding amounted to $7.60 a share on the 4,164,792 shares of common stock outstanding at December 31, 1952.

Federal, foreign income, and excess profits taxes and liability for renegotiation for the year 1953 were $53,863,000 as compared with $57,083,000 in 1952. Total taxes in 1953 amounted to approximately $93,480,000, equivalent to $22.29 a share of common stock, as compared with $91,416,000 in 1952.

Inventories at year end amounted to $128,322,640 compared with $131,242,828 at the year end of 1952. Domestic inventories of natural and synthetic rubber and rubber-like materials have been priced on the last-in, first-out (LIFO) basis in both years. The application of the LIFO basis of inventory pricing was expanded in 1953 to include employment costs (salaries, wages, and employee benefits) in inventory.

Depreciation and leasehold improvements for tax purposes in 1953 amounted to $13,435,913, as compared with $11,265,549 in 1952. Dividends totaling $2.75 a share on common stock were paid in 1953, which compares with $2.65 a share paid in 1952. Current assets at the end of 1953 were $315,951,473 and current liabilities were $105,581,406, a ratio of 3.0 to 1. Net working capital increased from $197,116,466 to $210,370,067 during the year.

Capital expenditures during 1953 for expansion and betterment of manufacturing, distribution, and research facilities amounted to $23,420,000. Capital expenditures during 1952 were $21,915,000.

Sheller Manufacturing Corp.

For 1953: Net profit of $3,551,035, including a non-recurring profit of $363,921, which is equal to $3.72 a capital share, compared with $2,635,029, or $2.76 a share, in 1952. Net sales in 1952 amounted to $46,704,575, against $44,406,706 in the previous year.

Plymouth Rubber Co.

Year Ended November 30: Net income of $225,164, which is equal to 25c a share, compared with a net loss of $21,416 in the previous fiscal year. Net sales in the year ended November 30, 1953, amounted to $15,739,908, against $15,092,664 in the year ended November 30, 1952.

CANADIAN NEWS

Construction is to get under way immediately on a multi-million dollar factory at Port Whitby for Dunlop Tire & Rubber Goods Co. When it is completed early next year, a large part of the company's operations in the manufacture of automobile and truck tires will be centered there. (Whitby is situated about 20 miles from Toronto.)

Machinery already on order for the new plant is of the newest automatic type and in addition to increasing output substantially, to meet the growing Canadian market demand, it is expected to give considerable savings in cost. Tires are manufactured at present in the Toronto plant of the company. The shift will make space available at the Toronto plant for expansion of industrial and foam rubber production.

Sales so far this year have shown an upward trend, according to George E. Beharrell, managing director and deputy chairman of the British parent company, who attended a meeting of directors of the Canadian company recently. He expressed optimism for a continued high level of activity in the near future, with the firm belief that company growth would continue steadily because of Canada's great future.

Recent improvement in Britain's international monetary affairs has made it possible for the parent Dunlop company to give more support to its offspring in North America, Mr. Beharrell stated, and he envisaged a rapid expansion of operations, based upon continuing research in the company's scientific section. This will concern not only rubber specialties, but a further development of the chemical and plastics field in which the company has pioneered.

Mr. Beharrell, in pointing out that Dunlop had not experienced a falling off of business in Canada recently, suggested that the word recession hardly was suitable for business conditions today. "It is, perhaps, a period of adjustment," he said, "the sort of natural correction which should not be alarming." While competition all over the world is increasing, he indicated that it could be met by well-founded economies and that it should prove beneficial rather than the reverse.

Dr. W. R. Collings, vice-president and general manager of Dow Corning Corp., announced recently that the newly organized Canadian subsidiary, Dow Corning Silicones, Ltd., has moved into its new office and warehouse building on Tippet Road, Wilson Heights, Toronto, and began doing business as of February 1.

The home of Dow Corning's Canadian company is conveniently located in metropolitan Toronto and contains 2,000 square feet of office space and 100,000 square feet of warehouse area. Dow Corning Silicones has taken over the sales service and warehousing operations which since 1945 have been carried on by Fiberglas Canada Ltd. as Canadian distributors of Dow Corning products. The Fiberglas personnel who have been engaged in the sales of silicones have been taken into the employ of the new company. "Dow Corning Silicones, Ltd. is thus well equipped to provide the growing Canadian market for silicones with experienced technical assistance and with prompt service from its warehouse stocks from one central location in Toronto," Dr. Collings said.

Dr. Collings also announced the appointment of D. C. R. Miller as general manager of the new company. Mr. Miller, an experienced product development engineer, and a long time resident of Toronto, is well known to Canadian industry. He served as manager of the Dow Corning Products Division of Fiberglas Canada, Ltd. since the beginning of its sales activities on silicone products. Prior to 1945, Mr. Miller was a development engineer on glass products for Fiberglas Canada.

Executive officers of the new company are Dr. Collings, president; Dr. Shailer L. Bass, vice-president; William C. Blackburn, secretary; and Burl D. Huber, treasurer. The board of directors is composed of Dr. Bass, Mr. Blackburn, Olin D. Blessing, Dr. Collings, Howard N. Fenn, Mr. Huber, Ira W. Hutchison and Mr. Miller.

Dr. R. Stephen Jane, vice-president and director of Shawinigan Chemicals, Ltd. since 1946, in charge of research, has been appointed executive vice-president of the company. Dr. Jane succeeds H. S. Reid, executive vice-president since 1951 and a director and vice-president since 1927, who is retiring.

Dr. Jane became chief chemist of the Canada Carbide Co. at Shawinigan Falls in 1927. When that company became the Carbide Division of Shawinigan Chemicals, Ltd. a few months later, he took charge of plant research for the division. In 1943 he was transferred to the parent Shawinigan Water & Power Co. to take charge of the industrial research department which was formed at that time.

Dr. Jane is also a director and vice-president of Canadian Resins & Chemicals, Ltd., and a director of B. A. Shawinigan Resins Corp. at Springfield, Mass., and of Gelvatex Coatings Corp. at Pasadena, Calif. President of the Chemical Institute of Canada in 1952-53, he is a fellow of that organization and a member of the Society of Chemical Industry and of other professional bodies.

Five justices of the Ontario Appeal Court have reserved their decision on an appeal by Canada's major Canadian rubber companies against an order restraining them from any further combine or price-fixing activities. The companies, which challenged the constitutionality of Mr. Justice Treleaven's order, are Goodyear Tire and Rubber Co. of Canada Ltd., Dominion Rubber Co. Ltd., Dunlop Tire and Rubber Co. Ltd., Gutta Percha and Rubber Ltd., and B. F. Goodrich Rubber Co. of Canada Ltd.

His order "prohibits the continuation or repetition of the offense, or the doing of any act or thing by the person convicted or any others directed toward the continuation or repetition of the offense."

"Parliament has not declared that any person who does an act directed toward a continuation of an offense is himself guilty of an offense," argued John D. Arnup, one of the defense counsel.

Petroleum refining, fermentation and food, protective coatings, and wire and plastics will be the main industries featured in the schedule of plant tours for the 37th Annual Conference and Exhibition of the Chemical Institute of Canada, which will be held in Toronto on June 21-23. In addition, those delegates interested in materials handling will also have the opportunity of visiting one of the most modern plants that stresses mass production and materials handling techniques. One visit has been planned for Canada Wire and Cable Co. Ltd., which is expected to be of interest to those in metals and plastics. Upwards of 1200 delegates are expected to attend this conference, which is the largest single chemical event in Canada.

In a monthly report made by the Purchasing Agents of Canada, it has been reported that higher prices for crude rubber before the end of 1954 is a distinct possibility. In the United States, the proportion of crude rubber consumption to total new rubber is steadily increasing at the expense of synthetic. Imports of crude rubber into Canada for October, 1953, amounted to 7,666,936 pounds with an average price value of 20.7c a pound. For first 10 months of 1953 imports totaled 68,307,423 pounds as compared with 53,106,996 pounds for the same period of 1952.

The Mayor of the City of Toronto has instructed officials of the National Rubber Co., where a $1,000,000 fire raged recently, to speed up the dispersal of their still-smoldering stockpile of scrap rubber. City Hall was swamped with complaints from residents of the area, who said that suffocating smoke and a vile stench were issuing from the pile of old rubber tires. Firemen were still watering the smoldering rubber four days after the blaze, while a bulldozer and crane brought in by the company worked to remove the burning scrap.

A. Ritchie, formerly associated with the Polymer Corporation at Sarnia, has joined the technical staff of the Merchants Rubber Factory of the Dominion Rubber Co.

J. R. McCallum, until recently associated with Industrial Adhesives, Ltd., at Montreal as factory manager, is now associated with the research group of the Quebec North Shore Co. at Baie Comeau.

P. J. McGale has been appointed to special assignments at the head office of the B. F. Goodrich Rubber Co. of Canada, Ltd., according to a recent announcement

by W. E. Ireland, vice-president and general manager of tire sales.

The Society of the Plastics Industry will meet for its twelfth annual conference on April 5 and 6 at the Mount Royal Hotel in Montreal. The theme of the conference will be "Plastics Step '54-ward", and will be divided into three general classifications. General management topics will include discussions of business forecasts, labor relations, and safety programs in small plants. Technical topics to be covered will include the new epoxy resins, glass reinforced melamines and polyesters, and large plastics moldings. The sales and merchandising section of the conference will deal with case studies of developing the market for melamine tableware, an informative labeling program and the sale of plastics to the appliance industries.

An important feature of the conference will be the presentation of the Canadian Plastics Achievement Awards. Winners of awards will be on display, together with a wide selection of other plastics products, arranged according to raw material classification. This exhibit will be open to the general public, and is designed to show the range of product possibilities inherent in the various raw materials.

To meet the terms of a 1952 anti-trust edict by a United States Court, Canadian Industries, Ltd., will be split into two independent companies on July 1, according to a recent announcement. The two concerns which control C.I.L., Imperial Chemical Industries of Great Britain and E. I. du Pont de Nemours & Co. of the United States, will divide the assets of the Canadian company in which each now hold a 41.8% interest.

The new companies will be known as Canadian Industries (1954), Ltd., of which Imperial Chemical Industries will own 83.3% control, and DuPont of Canada, Ltd., which will be owned 83.3% by the parent company. Minority shareholders, who now own 16.4% of C.I.L., will receive one and one-tenth shares in each of the new companies for each share in Canadian Industries (1954).

In the interim period, the Specialties Department of C.I.L. will continue the sale of DuPont's neoprene and rubber chemicals in the Canadian market. It is believed that after July 1, the sale of these products will be handled by DuPont of Canada. It has also been reported that the Fabrikoid Division of C.I.L. will become a part of Canadian Industries (1954).

The board of directors of Canadian Industries (1954) will consist of eight Canadians and four Britons. H. Greville Smith, present head of C.I.L., will be president. The board of DuPont of Canada will consist of six Americans and four Canadians. Herbert H. Lank, now a C.I.L. vice-president, will become president of DuPont of Canada.

Thirteen different design applications with Pliobond, Goodyear's all-purpose adhesive, are illustrated in a new informational folder prepared by the company's Chemical Division.

Goodrich Chemical Names Two

P. J. Weaver has been named manager of the Sales Development Laboratories of the B. F. Goodrich Chemical Co. at Avon Lake, Ohio, while W. E. Manring has been appointed technical service manager of the Plastic Materials Sales Department with headquarters in Cleveland, Ohio. Mr. Weaver joined the B. F. Goodrich Co. in Akron in 1943 after receiving his B.S. in chemical engineering from Purdue the previous year. He came to the Goodrich Chemical Co. in 1944 as a chemical engineer, and after holding various positions he was made a development supervisor at Avon Lake in 1947. Mr. Weaver was transferred to the Plastics Materials Sales Department in Cleveland in 1951 as the technical service manager, a position which he has held until now.

Mr. Manring was graduated from Wesleyan University, Middletown, Conn., in 1937, with a B. A. in chemistry. He came to Goodrich Chemical in 1948 as a technical service engineer at the Avon Lake sales development laboratories, after working for the American Cyanamid Co. for 11 years in both technical and sales capacities. In 1951 he was made a development supervisor, and the following year moved to Goodrich Chemical's Cleveland headquarters as a product engineer, a job he has held until his recent appointment.

High Pressure Cup Packing

E. F. Houghton & Co., Philadelphia, Penna., is now marketing a new cup packing made from leather impregnated with Thiokol Liquid Polymer. Designated "Vim No. 1243-311", the new packings are said to combine the resilience of rubber with the toughness of leather. The packings perform well under pressure of 0 to 15,000 pounds per square inch, temperatures of $-65°$ to $+200°$ F. and provide extremely tight seals against oils, solvents and gases. Because of their high resilience they are easy to install, cause less friction, and can be adapted to slightly eccentric or oversize cylinders.

A new bulletin covering every type of steam hose application has been announced by the Quaker Rubber Corp., a division of the H. K. Porter Co., Inc.

"He didn't say what calender he wanted, so I got him a Marilyn Monroe!"

McClure Appointed President

Harry B. McClure has been appointed president of Carbide and Carbon Chemicals, a division of Union Carbide and Carbon Corp. Mr. McClure succeeds Dr. J. G. Davidson who becomes chairman of Carbide and Carbon and a member of the Appropriations Committee of Union Carbide. Dr. Davidson is also a vice-president of Union Carbide and Carbon. Mr. McClure was born in Philadelphia. He received the degree of bachelor of science in chemical engineering and the degree of master of science in chemistry from the University of Pennsylvania, and served as an instructor in inorganic chemistry at this university. His first positon with Union Carbide was as a Research Fellow on the Carbide and Carbon Chemicals Fellowship at the Mellon Institute of Industrial Research in Pittsburgh. He served as a technical representative for Carbide and Carbon Chemicals in the Philadelphia area, and was later assigned to sales development work in New York. In 1936 he became manager of the Fine Chemicals Division. In 1944 he became a vice-president of Carbide and Carbon and was appointed executive vice-president in June, 1953.

For the past 20 years Mr. McClure has been concerned mainly with the development of new chemicals and with the finding of new industrial uses for these materials. He is the author of many technical papers and articles. In 1948 he was awarded the honorary degree of doctor of science by Morris Harvey College, and in 1950 he received the first honor award of the Commercial Chemical Development Association for valuable service to the chemical industry. Mr. McClure is a member of many technical and professional societies including the American Chemical Society, the American Institute of Chemical Engineers, the American Institute of Chemists, the Society of the Chemical Industry, the American Association for the Advancement of Science, and the New York Academy of Science.

To Head Pigments Research

Dr. Harold R. McCleary has been named manager of pigments research of the Bound Brook, N. J., laboratories of the Research Division of the American Cyanamid Co. Dr. McCleary joined American Cyanamid in 1941 as a research chemist in the Research Department of the former Calco Chemical Division at Bound Brook. In 1944 he was made a group leader and in 1949 sectional director for application research. From 1952 until his present appointment he was assistant manager of pigments research. Dr. McCleary has had published, in conjunction with other scientists, a number of technical papers in the field of organic reactions, dyeing of textile fibers and related topics. A graduate of Monmouth College (Ill.), Dr. McCleary received his Ph. D. degree at Columbia University. He is a member of the American Chemical Society, American Association of Textile Chemists and Colorists, Society of Dyers and Colourists and the Faraday Society, both of England, American Institute of Chemists, and the Technical Societies Council of New Jersey of which he is vice-president.

LOS ANGELES NEWS

The March 2 meeting of the Los Angeles Rubber Group which was scheduled to be held at the Hotel Statler in Los Angeles, Calif., was to have been addressed by Floyd Burgner, safety director of the Firestone Tire & Rubber Co. Mr. Burgner was to have spoken on, "Safety in the Rubber Industry." The non-technical portion of the meeting was to have been addressed by Roy E. Weatherby. Mr. Weatherby was to have shown his color film, "Safari Around the World—1953." A report on the meeting will appear in the April issue of RUBBER AGE.

John Ryan, who recently returned to the Los Angeles area from the Gadsden Ala., plant of the Goodyear Tire & Rubber Co., has been appointed foreman of the Preparation Department.

Claude Corkadell, formerly chief of research compounding for the Gates Rubber Co., Denver, Colo., has joined the staff of the Oliver Tire & Rubber Co., Oakland, Calif.

Harry S. Komer has been appointed superintendent of the Chemical Materials Department plant of the General Electric Co. at Anaheim, Calif. Mr. Komer, a native of Amsterdam, N. Y., is a graduate of the Bentley School of Accounting and Finance. He entered the company in October, 1945, and was assigned to the general office in Schenectady, N. Y. In 1948, he was transferred to the Anaheim plant as supervisor of payroll and costs. Recently he was appointed supervisor of finance and in his new position will continue to perform the duties of that post along with his new assignment. During World War II, Mr. Komer served in the Army Finance Corps., later saw duty in Italy and Brazil as a captain in the Air Force.

C. M. Christie, founder and president of the American Latex Products Corp., Hawthorne, Calif., has been re-elected to the board of directors of the Dayton Rubber Co., Dayton, Ohio. Mr. Christie's career in the rubber industry is long and colorful. He is a pioneer in the market development of foam rubber in the field of aircraft seating, theater seating and in the furniture and shoe industries. Formerly, he was affiliated with several large rubber manufacturing firms, having been exlusive foam rubber distributor for a national firm for twelve years in the eleven western states. Recently, with the establishment of his new Plastics Division, Mr. Christie leads the field in the development of foam-in-place plastics for industry. American Latex Products is a subsidiary of Dayton Rubber.

R. & J. Dick Co., Passaic, New Jersey, has announced the opening of a new Southern California office and warehouse at 5276 Atlantic Boulevard, Maywood (Los Angeles), Calif. A complete inventory of power transmission and conveying equipment, including full service facilities, will be maintained in line with the steadily growing industrial demands of the area. The new service center marks the third for R. & J. Dick Co. on the West Coast. The company previously established similar facilities at San Francisco and Seattle.

New Phthalate Plasticizer

A new, low-cost, highly compatible phthalate plasticizer has been developed by the Plasticizer Division of the Pittsburgh Coke & Chemical Co., Pittsburgh, Penna. The new plasticizer, "Pittsburgh PX-114" (decyl butyl phthalate) can be used to reduce vinyl formulating costs without affecting the quality and performance characteristics of many types of products, the company states. Pittsburgh PX-114 is a primary plasticizer and is comparable to dioctyl phthalate in low temperature flexibility, mechanical properties, and permanence properties. Heat and light stability are good, as may be expected from a dialkyl phthalate, and no special stabilization problems are involved. Pittsburgh PX-114 is somewhat more volatile than DOP.

Serious consideration, the company states, should be given to the use of Pittsburgh PX-114 for the manufacture of such items as high quality garden hose, welting, gasketing, inflatable toys, sheeting, etc. In combination with less volatile phthalates, Pittsburgh PX-114 can help in reducing the cost of manufacture of vinyl film. Plastisols and organisols containing this new plasticizer may be used for the manufacture of all types of slush molded or dip molded items and for dispersion coating operations. Basic supplies of raw materials to produce the new plasticizer are virtually unlimited, according to the company. Pittsburgh PX-114 is now in production and is available for immediate shipment from the company's facilities at Pittsburgh, Penna., Boston, Mass., and Lyndhurst, N. J.

Data on Awards in Rubber

In response to widespread requests, the publishers of "Who's Who" have begun gathering material for a comprehensive volume covering awards of national reference interest made during the year in the United States. One of the major classifications is awards in the field of rubber. All donors of awards, prizes, and fellowships and scholarships of national importance relating to this field are invited to send full particulars to the publishers for consideration and possible inclusion. Address The Blue Book of Awards, A. N. Marquis Company, Marquis Publications Building, Chicago 11, Ill.

Purchases Glasfloss Division

The signing of a contract under which the Pittsburgh Plate Glass Co. has agreed to purchase the fiber glass manufacturing facilities and other assets of the Glasfloss Division of Tilo Roofing Co., Inc., has been announced jointly by Richard B. Tucker, executive vice-president of Pittsburgh Plate Glass and R. J. Tobin, president of Tilo Roofing. Assets of the Glasfloss Division include the manufacturing plant at Hicksville, Long Island, N. Y., machinery and other equipment for fiber glass manufacture, inventories on hand, patent rights, trade marks and goodwill. The purchase price was not disclosed.

The Hicksville plant was constructed during 1946 for the government's Defense Plant Corp. It was designed as a fiber glass manufacturing plant and contains approximately 80,000 square feet of floor space. The Hicksville plant has approximately 200 employees. Pittsburgh Plate entered the fiber glass production field during 1951. The Fiber Glass Division, with a plant at Shelbyville, Ind., produces superfine fiber glass insulation for the automotive industry, duct insulation and electrical appliances. In addition, the Indiana plant commenced production of continuous glass filaments for yarns and plastic reinforcements early last year.

According to Mr. Tucker, purchase of the facilities of the Glasfloss Division will permit Pittsburgh Plate to broaden the scope of its fiber glass products and markets. The Glasfloss plant employs a technology entirely different from that used at Pittsburgh Plate Glass' Shelbyville plant and produces a much thicker fiber. The Hicksville plant utilizes this thicker fiber in the manufacturer of battery separators and air filters, products not previously manufactured by Pittsburgh Plate. Mr. Tobin stated that by the sale of the Glasfloss Division, Tilo Roofing discontinues its activities in the glass fiber industry, but will continue its major operations, which consists of the manufacture of asphalt roofing and asbestos-cement sidings in its factory at Stratford, Conn. and the performance of roofing and siding work through its 58 branch offices located in 10 northeastern states.

Alubragum Latex Thickener

W. H. & F. Jordan, Jr., Manufacturing Co., 2126 East Somerset St., Philadelphia 34, Penna., has introduced "Alubragum," an aqueous solution of sodium polyacrylate which finds use in the thickening of latex. "Alubragum 402" is a 10% aqueous solution of sodium polyacrylate so formulated and composed that its maximum effectiveness takes place with high concentrations of GR-S Latex IV as the base. "Alubragum 825" enjoys properties making it prominent in the field of general thickening. Whereas 402 is designed for specialized application, 825 has a wide range covering high dilutions and all types of latex. Its nature makes it adaptable for so-called cutback compounding, the company states, wherein the concentrated compound is reduced with water and reheavied for certain effects. Samples as well as a booklet describing the Alubragums are available from the company.

New Gum Rosin Products

Chemists of the Department of Agriculture have developed a new class of hydroperoxides from derivatives of gum rosin. These products are described in U. S. Patent No. 2,653,922, entitled "Hydroperoxy-substituted Rosin Materials and a Method for their Production," issued September 29, 1953, to F. L. McKennon and R. V. Lawrence, assigned to the Secretary of Agriculture. Members of the Naval Stores Research Section, Olustee, Fla., a part of the Southern Utilization Research Branch, New Orleans, La., formed the new products by oxidizing esters of hydrogenated or disproportionated rosin. Their goal was to expand rosin's uses, in view of rosin's losses of large export markets, as well as some domestic markets, due to the appearance of new chemicals in other industries.

The new series of hydroperoxides may turn out to be useful as catalysts in the production of synthetic rubber or as intermediates in the preparation of certain products containing the rosin nucleus. One peroxide, prepared by oxidation of the hydrogenated methyl ester of rosin, was promising as a catalyst in the production of cold rubber in a test conducted by the Government Rubber Laboratories at Akron, Ohio, and led to improvement in some properties of the rubber. This invention may be used without payment of royalty. A copy of the patent may be purchased for 25 cents from the U. S. Patent Office, Washington, D. C. More information on hydroperoxides from rosin may be obtained by writing the Naval Stores Station, Olustee, Fla.

Antonovich and Gardner on Trip

Matt F. Antonovich and Charles Gardner, executives of the Advance Solvents & Chemical Corp., New York, N. Y., left the United States on March 7 for an extended business trip through South America. Mr. Antonovich is vice-president and general manager of Advance International, Ltd., and was recently appointed vice-president in charge of foreign operations for the parent company. Mr. Gardner has been associated with Advance Solvents for the past eight years and has been acting as eastern sales manager. He also holds the position of technical director of Advance International, a recent appointment. The trip will include calls on the paint, textile, leather and plastic industries of Brazil, Colombia, Argentina, Chile, Venezuela and Peru. It will also afford the company an opportunity to enlarge its sales agency arrangements throughout South America.

Creative Foam Moves Factory

After operating a pilot plant for the past eight months at 135 West 17th St., New York 11, N. Y., the Creative Foam Rubber Corp. has moved its factory to larger quarters at 139 West 19th St., New York 11, N. Y. The company maintains headquarters at 260 Fifth Avenue, New York 1, N. Y., and is now in full operation manufacturing small molded foam rubber products.

Bolton Named Gibbs Medalist

Dr. Elmer K. Bolton

Dr. Elmer K. Bolton, who retired in 1951 as chemical director of E. I. du Pont de Nemours & Co., Inc., has been named 1954 winner of the Willard Gibbs Medal awarded by the Chicago Section of the American Chemical Society. Dr. Bolton was a leader in the development of nylon and in the synthesis of neoprene. One of the highest honors in American chemistry, the medal will be awarded to Dr. Bolton at a dinner meeting of the Chicago Section on May 21. Dr. Bolton, in the words of the Gibbs Medal citation, is noted as "a founder of the technology of the American dyestuffs industry," for his work in preparing dyes during World War I. In 1922, Dr. Bolton was made director of research of DuPont's Dyestuffs Department. He proceeded to direct researches in rubber accelerators, antioxidants for rubber and gasoline and a search for synthetic rubber. Through his broad scientific activities, Dr. Bolton became assistant director of DuPont's Chemical Department in 1929 and director in 1930. The following year the search for synthetic rubber culminated in the development of neoprene.

Hycar 1500X207 Latex

B. F. Goodrich Chemical Co., Cleveland, Ohio, has announced the development of "Hycar 1500X207," a new experimental latex which is said to have outstanding properties in both the cured and uncured state. With a specific gravity of 1.01 at 25° C., the new latex is 40% total solids. It has excellent film-forming characteristics and is readily thickened to a casting consistency with ammoniated, borated, or caustic-cut casein. The cast films have excellent physical properties and oil resistance. Because of its outstanding film properties, the latex can be used for applications in the paper, leather and textile industries. As this latex film is thermoplastic, it is heat sealable and forms an excellent bond to itself and to plasticized vinyl films.

Tired of waiting for this copy of RUBBER AGE to reach your desk? Use the coupon on page 998.

Dacar Dryback Adhesive

A new adhesive for manufacture of dryback, which requires only solvent activation, has been developed by the Dacar Chemical Products Co., Pittsburgh, Penna. The adhesive-coated dryback gives bond strength of wet cements, yet shows no tendency to block at elevated temperatures, the firm states. "Dacar Dri-Bak Adhesive," applied like paint in liquid form to strips or sheets, is fast drying. When dry, the pieces can be packed and shipped without danger of blocking. The user merely activates the adhesive film by wiping with solvent prior to use. Fast grab and rapid full strength adhesion are features. The adhesive is particularly adapted for use on sponge rubber, rubber, weather-stripping, etc. for application to metal, glass, wood and many other surfaces. In tension or "peel," the sponge rubber tears without failure of the bond. High bond strength is retained even at elevated temperatures. The company has also developed "Dacar Adhesive No. A-33," a wet adhesive which yields similar bond strength.

Pennsalt Introduces NeoFloor

"NeoFloor", a new, economical and easily applied skid-proof surface coating for concrete, wood and metal floors, has been developed by the Pennsylvania Salt Manufacturing Co., Philadelphia, Penna., for use in plants, shops and other places where oils, greases and chemicals create safety hazards and maintenance problems. NeoFloor is a grit-like material anchored in a matrix of resilient neoprene and bonded firmly to the floor with an adhesive primer. Both primer and coating are supplied in liquid form for easy, quick-drying application with brush or roller. The product is said to be a tough, tightly bonded material which is highly resistant to fumes, spillage from acids, alkalies, salt solutions and solvents at temperatures up to 220°F. Also waterproof, NeoFloor is impervious to oils and greases and is easily cleaned with commercial detergents and cleaners.

St. Clair Buys Three Buildings

St. Clair Rubber Co., Detroit, Mich., has purchased three buildings of the plant formerly operated by the Dow Chemical Co. in Marysville, Mich. With the 40,000 square feet available in the new structures, the total manufacturing space of St. Clair Rubber will be approximately 150,000 square feet. Current plans call for an expansion of the company's facilities with complete modernization of the equipment in the present buildings.

Freeze-Thaw Stable Latex

American Polymer Co. of the Chemical Division of the Borden Co., Peabody, Mass. has announced a new "freeze-thaw stable" butadiene-styrene latex. This freeze-thaw stable high styrene-butadiene copolymer carries the designation "P-556". It has been specifically developed as a pigment binder for the paint industry. However, due to other unusual properties and low foaming characteristics, it can be used in the paper and related fields.

OBITUARIES

Aubrey W. Phillips

Aubrey W. Phillips, who started as a factory worker and became general manager of manufacturing of the General Tire & Rubber Co., died on February 1 in Mt. Sinai Hospital in Baltimore, Md. He was 53 years old. Born in East Fairfield, Ohio, Mr. Phillips started his career in the rubber industry with the McGraw Tire & Rubber Co. in East Palestine, Ohio, as a factory employee. After a short affiliation with the Columbiana Rubber Co. in Columbiana, Ohio, Mr. Phillips served with the Merchant Marine during World War I. In 1920, he joined the Mason Tire & Rubber Co. in Kent, Ohio as a foreman and rose to production superintendent before leaving to join the B. F. Goodrich Co. in 1928. At Goodrich, his assignments took him to a number of the company's plants in this country and Mexico. At the time he transferred to General Tire in 1946, Mr. Phillips was general superintendent of the Tire Division at Goodrich. He first was assistant to the vice-president in charge of manufacturing at General Tire. Several months later, he was promoted to the position of general manager of manufacturing. A member of many technical and fraternal associations, Mr. Phillips was graduated from the Harvard Graduate School of Business Administration. He is survived by his wife and a brother, David K., director of industrial relations at the Waco, Texas, plant of General Tire.

James O. Meyers

James O. Meyers, head of James O. Meyers & Sons, Buffalo, N. Y., for the past twenty years, died on January 30 at his home in that city. He founded the company bearing his name in 1933 as a manufacturer's representative and distributor of chemicals. A graduate of the University of Buffalo School of Pharmacy, for several years he operated a pharmacy in Buffalo. He then became a manufacturer's representative for industrial chemicals. A past-president of the Kenmore Lion's Club, Mr. Meyers was also a past-president of the Buffalo Paint, Varnish and Lacquer Association. He is survived by his wife, two sons, both of whom were associated with him in the company, and three daughters.

Henry J. Podesta

Henry J. Podesta, associated with Parker, Stearns & Co. of Brooklyn, N. Y., as a sales specialist in rubber to metal adhesion, died on February 9 in New York, N. Y., after a brief illness. Mr. Podesta had been associated with the rubber industry for about 17 years and had been with Parker, Stearns for about 7 years. Services were held at Our Lady of Refuge Church in Brooklyn on February 13 with interment in Calvary Cemetery, Woodside, L. I., N. Y.

Dr. Charles L. Parsons

Dr. Charles Lathrop Parsons, secretary of the American Chemical Society from 1907 to 1945, and one of the country's leading chemists, died on February 13 in Pocasset, Mass. He was 86 years old. An educator and government official, he helped to organize the Chemical Warfare Section of the U. S. Army in World War I and was among the first in this country to urge experimentation with radium. His work in nitrogen fixation was known to chemists throughout the world. Dr. Parsons was born in New Malboro, Mass., in 1867, and was graduated from Cornell University in 1880. He later received honorary doctorate degrees from the University of Maine, New Hampshire and Pittsburgh. In 1911, he was appointed chief of the Division of Mineral Technology of the Bureau of Mines and was named the Bureau's chief chemist five years later. He received many foreign honors including appointment as officer of the French Legion of Honor. Among his American awards was the American Chemical Society's Priestley Medal, highest honor in American chemistry. He was a member of many technical and fraternal societies. Surviving are three daughters.

Allan H. Butz

Allan H. Butz, vice-president of the International Division of the Minnesota Mining & Manufacturing Co., died unexpectedly on February 15 at Del Ray Beach, Fla., while vacationing with members of his family. Mr. Butz, 51 years old, had suffered a heart attack. Mr. Butz joined 3M in 1925 as a laboratory helper and in 1926 he was made chief clerk in the New York office. Entering sales work, he became acting sales manager of the New York office in 1928 and sales manager in 1930. He was promoted to eastern sales manager for the company in 1936 and eastern regional manager in 1944 when he moved to St. Paul. In 1951 Mr. Butz was made vice-president in charge of sales in the 3M International Division. He helped establish branch offices throughout the world and traveled extensively in Europe and South America.

Percy D. Radford

Percy D. Radford, former co-owner and vice-president of the West American Rubber Co., Los Angeles, Calif., died on January 29. He was 64 years old. Born in London, England, he served with the British Army in France during World War I. In 1928, Mr. Radford came to Los Angeles and joined his brother, Douglas, who had purchased the West American Rubber Co. Due to ill health, Mr. Radford had been on a leave of absence for the past year and one-half. Surviving are his wife and two children and his brother.

Jacques P. Wolf

Jacques Phillip Wolf, founder and president of Jacques Wolf & Co., Passaic, N. J., died on January 26, 1954, at his Montclair, N. J. home after several years' illness. An internationally-known industrialist, he headed a firm of manufacturing chemists which became a major supplier of chemical products for the rubber, textile, leather, food, drug and cosmetic, paper and allied industries. Born in Mulhouse, France in 1873, Jacques Wolf was educated in France and came to the United States in 1901, at the age of 28. Mr. Wolf began his career in the chemical business with a partner, Abran De Ronde in the basement of an old Passaic whip factory. The original firm name, Wolf & De Ronde, was later changed to Jacques Wolf & Co. Under Mr. Wolf's leadership, the company grew from a basement business to its present world-wide operation with plants in Clifton, Passaic, Carlstadt and Los Angeles, with an extensive export trade to all parts of the globe. Although an invalid for several years, Mr. Wolf was in constant touch with the business and kept a portable laboratory in his Montclair apartment for experimentation.

E. Norman T. Griffith

E. Norman T. Griffith, vice-president of G. L. Griffith & Sons, Ltd., Stratford, Ont., Canada, died on January 22 in Stratford. Born on October 17, 1903, in Melbourne, a village west of London, Ontario, Mr. Griffith received a B. A. degree from Victoria University in Toronto. He joined the family business in 1925 after leaving college and toured the Canadian West as a sales representative. At that time, the firm was engaged in the manufacture of leather harness. A few years later the company began the manufacture of rubber items, and this part of the business expanded rapidly. Mr. Griffith's responsibilities increased and for many years he served as vice-president and sales manager. Mr. Griffith was prominent in children's aid work, was deeply interested in his church and was one of those who gave financial leadership to the Stratford Shakespearean Festival Foundation in its critical months. He is survived by his wife, daughter, and brother, Ewart T., president of the company.

Harry G. Eckhardt

Harry G. Eckhardt, purchasing agent for Lea Fabrics, Inc., Newark, N. J., died at his home in Union, N. J., on February 4, after suffering a heart attack. He was 58 years old. He had been associated with Lea Fabrics for thirty years. Born in Brooklyn, N. Y., he served with the U. S. Army during World War I. Mr. Eckhardt was a member of the Elks and a Mason. He was a member of the Division of Rubber Chemistry of the American Chemical Society and had been active in the affairs of the New York Rubber Group. Funeral services were held at St. John's Lutheran Church in Newark, followed by Masonic and Elk rites, with interment in Hollywood Memorial Park. He is survived by his wife.

IN SUBMARINES...

World's first atomic-powered submarine, the USS Nautilus shown being launched at the yards of the Electric Boat Div. of General Dynamics Corporation. It will dive deeper, travel faster under water and stay submerged for month without refueling.

Setting new standards of PROGRESS

IN THE RUBBER INDUSTRY...

Muehlstein, as it has for over forty years, continues to advance its standards of service as leading supplier to the rubber and allied industries through progressive business methods and constantly increasing efficiencies of operation.

H. MUEHLSTEIN & CO. INC

60 EAST 42ND STREET,
NEW YORK 17, NEW YORK

BRANCH OFFICES: Akron · Chicago · Boston · Los Angeles · Memphis · WAREHOUSES: Akron · Chicago · Boston · Los Angeles · Jersey City

CRUDE RUBBER, SYNTHETIC RUBBER, SCRAP RUBBER, HARD RUBBER DUST, PLASTICS

William L. Pitcher

William L. Pitcher, president of the Easthampton Rubber Thread Co. and the United Elastic Corp., both of Easthampton, Mass., died at his home in that city on February 13. He was 82 years old. Mr. Pitcher was the son of the late Franklin W. Pitcher, former head of Easthampton Rubber Thread. Upon being graduated from Williston Academy in Easthampton, William Pitcher joined his father in the business. Besides being president of Easthampton Rubber Thread, Mr. Pitcher also served as treasurer and general manager. He was a director of the Industrial Mutual Insurance Co. of Boston, Mass.; Smith-Lee Corp., Oneida, N. Y.; Beaver River Power Co., Beaver Falls, N. Y., and Latex Fiber Industries, Beaver Falls, N. Y. He was treasurer of the Easthampton Cooperative Bank for more than fifty years. Mr. Pitcher was also vice-president of the Easthampton Savings Bank and a director of the First National Bank of Northampton, Mass. Funeral services were held on February 15 in Easthampton. He is survived by his daughter.

Frank S. Sternad

Frank S. Sternad, an experimental engineer in the Machine Development Division of the B. F. Goodrich Co., and widely-known in the rubber industry as a designer and builder of tire-making machinery, died suddenly of a heart attack on January 31 at St. Thomas Hospital in Akron, Ohio. He was 62 years old and had been associated with Goodrich since 1917. Born in Austria, Mr. Sternad came to the United States just before World War I, and served with the U. S. Army for two years. He was with Goodrich at the outbreak of the war and returned to the company in 1919. Mr. Sternad was a member of the Foremen's Club. Services were held on February 3 at the Weller Funeral Home in Cuyahoga Falls, Ohio, with burial in Rose Hill Burial Park. He is survived by his sister.

Mason T. Rogers

Mason T. Rogers, former vice-president in charge of sales for the Dewey & Almy Chemical Co., died at his home in Belmont, Mass. on February 9 after a long illness. He was 67 years old. Born in Watertown, Mass., Mr. Rogers was graduated from Harvard College in 1908. A year later he earned a master's degree in civil engineering at the Scientific School at Harvard. During his career as an engineer, Mr. Rogers worked on the construction of the Panama Canal as a hydraulic engineer. In 1930, following a long period in which he operated his own sales business, Mr. Rogers joined Dewey & Almy as vice-president in charge of sales. During World War II, Mr. Rogers worked on packaging for the Armed Forces. He is survived by his wife and son.

The Union of South Africa will for the first time become self-sufficient in production of "Aero" brand cyanide, when South African Cyanamid (Pty.), Ltd., completes construction of a calcium cyanamide plant at Witbank.

Subway Getting Foam Seats

The rattan seats that have been identified with New York City's subway cars since the 1880's will give way to foam rubber cushions covered with a deep red plastic fabric, according to a recent announcement by the New York City Transit Authority. The Authority has already awarded contracts for new seats for 200 subway cars with a third contract for 100 more cars in the offing.

New Multi-Purpose Plasticizer

A new epoxy plasticizer, "Pittsburgh PX-800 Epoxy," which can markedly improve the stability and permanence of vinyl formulations, is now being offered by the Plasticizer Division of the Pittsburgh Coke & Chemical Co., Pittsburgh, Penna. "Pittsburgh PX-800 Epoxy" is a highly compatible polymeric type plasticizer recommended for use with vinyl resins and synthetic rubbers. It is said to offer definite advantages over ordinary plasticizers in permanence and volatility. Being of the epoxy type, it also has the distinct advantage of serving in vinyl compounds as a stabilizer to both heat and light. Its use can reduce the amount of metallic stabilizer that would ordinarily be required.

Vinyl compounds containing the product exhibit low volatility and excellent resistance to extraction by oil, gasoline, and soap solutions. When included in a properly formulated compound, Pittsburgh PX-800 Epoxy will remain compatible with vinyl resins after long periods of exposure to light, including window exposure. The company believes that this new epoxy plasticizer can play an important part in the development of formulations requiring superior stability and permanence. It recommends the use of Pittsburgh PX-800 Epoxy in vinyl calendering, extrusion, and molding compounds, and in plastisol and organisol formulations.

Elected to Board of Directors

Alwin C. Eide, of Columbus, Ohio, has been elected to the board of directors of the American Zinc, Lead and Smelting Co. to fill the vacancy caused by the death of V. C. Bruce Wetmore of Boston, Mass. Mr. Eide has been in the employ of the company since 1916 starting as research chemist at Hillsboro, Ill. and later at Caney, Kans. From there he was transferred to St. Louis where he spent three years in the Metallurgical Department. He then served four years as manager of the Chicago sales office and was transferred from there to Columbus, Ohio, as sales engineer, in which capacity he served for approximately fifteen years. He has been manager and later vice-president of American Zinc Sales and of the American Zinc Oxide Co. since 1944. He was elected vice-president of the parent company in 1950. Mr. Eide is a graduate of the University of Illinois with a B. S. degree in chemical engineering.

"All-Purpose" Truck Tire

A new "All-Purpose" truck tire that wears longer on the road and pulls better off the road has been announced by the B. F. Goodrich Co., Akron, Ohio. The tire is designed for those truck operators who drive most of their mileage on the highway but who need extra traction for short distances off the highway. Loggers, sand and gravel haulers, ready mix concrete trucks, oil field haulers, pipe line contractors, excavating contractors and a host of other truck operators who must operate on and off the highway will find the new All-Purpose geared to their needs. Massive all-purpose cleats on the tire pull trucks through rugged off-the-road service. V-shaped tread grooves between lugs widen toward the shoulders, help stone ejection action. Other construction features include a tread that is 30% deeper. A center wear bar reduces rate of wear in the center of the tread. Sharp edges give resistance to side slippage. Buttons on alternate all-purpose cleats defy dangerous skids on the highway and resist slippage off the road. The All-Purpose pulls without bogging down, gives positive traction in forward or reverse. Built into the All-Purpose truck tire is the patented B. F. Goodrich nylon shock shield, plus an extra shock shield directly under the tread which prevents bruise breaks. These built-in shields add strength to the tire without adding bulk under the tread where heat is most likely to occur. Early failures are prevented and a bigger percentage of the tires can be recapped. The new All-Purpose B. F. Goodrich truck tire is available with a nylon cord body as well as in rayon cord construction.

General Tire Promotes Two

Carl J. Adelman has been named purchasing agent for engineering services and products at the General Tire & Rubber Co., Akron, Ohio, succeeding the late Emil Schnedarek. Also announced was the appointment of Wayne N. Grubaugh as assistant purchasing agent for rubber chemicals and rubber pigments. Mr. Grubaugh succeeds Mr. Adelman in his new assignment. Mr. Adelman has been associated with General Tire for the past twenty years. He started in the factory and moved into the Mechanical Stores Department after being named an assistant purchasing agent in 1946. He holds a B. A. degree from the University of Akron and is a member of the Purchasing Agents Association of Akron. Mr. Grubaugh, a buyer since joining General Tire in 1951, is a graduate of Kent State University with a B. S. degree.

Develops New Slipper Compound

Anaconda Wire & Cable Co., New York, N. Y., has developed a new slipper compound which is used on the company's type "TW" wire. The company states that the new slipper compound does not deteriorate with aging, nor do its oils dry out in use. Tests in the laboratory, and extensive production testing in the field, have demonstrated that TW wire with its special "slipper compound" appears to meet the important objections previously made against other lines on the market, the company states.

HERE'S EXPERIENCE THAT CAN HELP YOU WITH YOUR PROCESSING

When you need a process aid or have a problem involving one, it will pay you to take advantage of Sun's technical knowledge and experience in the field.

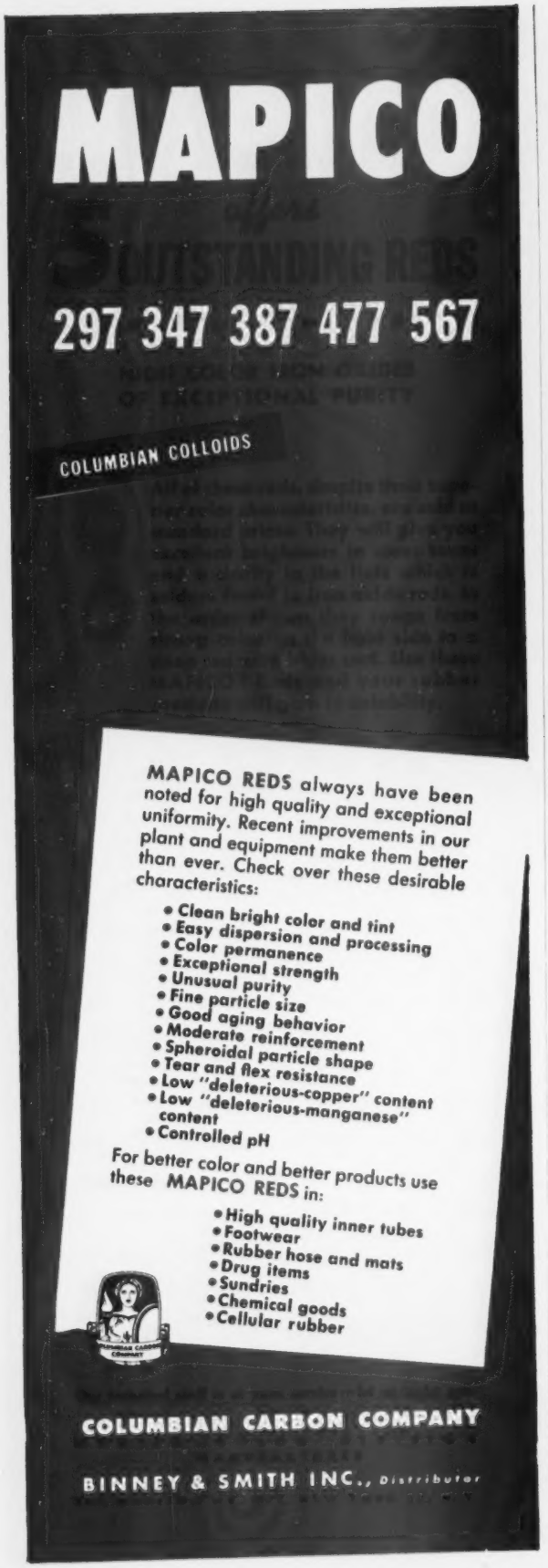
As early as 1937, working with leading rubber companies, Sun made commercially available a petroleum derivative remarkably suited for plasticizing Neoprenes, natural rubbers and reclaims. This was followed by a number of other process aids—among them Circosol-2XH, an elasticator that greatly improved the rebound properties of GR-S synthetics; and Sundex-53, a low-cost product highly compatible with natural rubbers, GR-S, reclaims, and various combinations of the three. Leadership in the field and knowledge of the industry's requirements brought about Sun's participation in the experimental work which led to the development of oil-extended synthetic rubbers.

Put this experience, plus a complete line of products, to work for you—in lowering costs, in improving product quality, in solving processing problems. For the assistance of Sun's rubber technologists, write SUN OIL COMPANY, Dept. RA-3.

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL


MAPICO
297 347 387 477 567
COLUMBIAN COLLOIDS
MAPICO REDS always have been noted for high quality and exceptional uniformity. Recent improvements in our plant and equipment make them better than ever. Check over these desirable characteristics:
• Clean bright color and tint
• Easy dispersion and processing
• Color permanence
• Exceptional strength
• Unusual purity
• Fine particle size
• Good aging behavior
• Moderate reinforcement
• Spheroidal particle shape
• Tear and flex resistance
• Low "deleterious-copper" content
• Low "deleterious-manganese" content
• Controlled pH
For better color and better products use these MAPICO REDS in:
• High quality inner tubes
• Footwear
• Rubber hose and mats
• Drug items
• Sundries
• Chemical goods
• Cellular rubber
COLUMBIAN CARBON COMPANY
BINNEY & SMITH INC., Distributor

NEW GOODS

U. S. Rubber Breathable Naugahyde

U. S. Rubber Co., New York, N. Y., has started production on a new line of breathable vinyl upholstery for use in transportation seating, institutional, home and office furniture. "Breathable Naugahyde" is made on new machinery developed in the company's Mishawaka, Ind., plant, so the porous, breathable feature is part of the basic construction. It is said to assure complete seating comfort when used over foam rubber cushioning or deep springs. Breathable Naugahyde vinyl upholstery is now being made in four colors—turquoise, grey, dark green and maroon—and can be made in a variety of other colors, textures and patterns. It is 54 inches wide and is sold in 30 yard rolls. It has a strong cotton fabric backing. Breathable Naugahyde has a slip finish. It is easy to maintain since it won't absorb dust and can be cleaned with a damp cloth, the company states. The firm said the new porous upholstery is considered practical for use in seating in busses, trucks, railroad cars, automobiles, airplanes, hotels, restaurants, theaters and hospitals, as well as in home and office furniture.

Rayon Conveyor Belts

Conveyor belts made of rayon which weigh less than conventional cotton duck belts but are equally as strong are now being marketed by the U. S. Rubber Co. Rayon has proved to be more resistant to ripping or tearing than duck plies and is used in both the lengthwise and crosswise directions of the belt. In the crosswise direction rayon makes the belt more flexible and more troughable, which results in less spillage. Since rayon weighs one-third less than cotton, yet is equally strong, there is a saving in power required to operate the belt.

Field tests have indicated that rayon belts like other belts made with synthetic fibers hold fasteners better than conventional duck belts. The rayon belts can also be repaired with the same techniques as conventional duck belts. They can be used in most locations where duck belts are now used, especially in coal mines, steel mills, cement plants and coal preparation plants. These rayon belts will be marketed under the trade names "U. S. Matchless" and "U. S. Giant."

Corrugated Rubber Matting

A new line of corrugated rubber matting has been introduced by the Goodyear Tire & Rubber Co., Akron, Ohio. Designed for clubs, stores, hospitals and other locations where a durable, long-wearing, non-skid surface is required, the matting is made in cocoa brown, ebony black and burgundy. New rubber compounds and a continuous manufacturing process have been used to achieve improved appearance and increased wear and scuff resistance. Abrasion resistance under laboratory test is reported by the manufacturer as four times that of previous types of matting. The new matting is available in all-rubber construction in one-eighth inch thickness or with cloth reinforcement in both one-eighth inch and three-sixteenths inch gauge. Both constructions are available in full rolls or half rolls in standard widths from 24 inch to 72 inch.

Bayshore Sea Fins

Bayshore Industries, Elkton, Md., has introduced a new line of swim accessories called "Sea Fins." Designed like the flippers of the famous "frogmen," the

fins are an especial aid to young swimmers. Made of pure yellow latex, the fins are decorated with an attractive green spray. The fins are display-packed in a clear cellophane bag.

Gortite Flexible Sleeves

A & A Manufacturing Co., 2017 W. Clybourn St., Milwaukee 3, Wisc., has introduced a new line of "Gortite" flexible, telescopic sleeves, Made to specifications without mold charge, sleeves up to 24 inches in diameter and as long as 30 feet have been fabricated for numerous requirements. Round, square, rectangular and triangular sleeves of all sizes are made to operate in angular, horizontal or vertical positions. The sleeves are said to afford maximum protection to moving parts while overcoming the weaknesses of leather boots. Made with neoprene, the sleeves withstand temperature changes from —60° F. to 220° F., without cracking. Sharp flexing of the accordion sections does not readily break down the sleeves, the company states. In addition to their wear-resistant qualities, a high degree of flexibility and softness permits compressing Gortite sleeves to fit into tight spots.

Goodrich Soft Rubber Heels

An extra soft rubber heel designed for men's shoes has been introduced by the B. F. Goodrich Co., Akron, Ohio. Made of a special rubber, the new heel is said to be twice as soft as ordinary rubber heels. Goodrich states that the new heel actually weighs so little it floats in water. Made for men's shoes only, in a Universal color, the heel has a wood core for easy attachment. The wood core is waterproofed and will not rot if moisture ever seeps between heel and sole. The light weight heel has been designed for the shoe repair trade and is already available in some sections of the country.

The Best Method Yet Devised . . .

FOR DICING SHEET STOCK

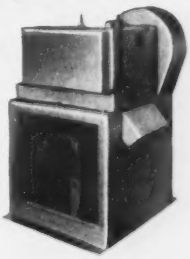
The Famous CUMBERLAND "Stair-Step" Dicer

Here at last is the answer to your problems of dicing rubber or vinyl sheet stock. Produces perfect cubes ranging in size from ⅛ to ½" by merely changing knives.

Comes in two sizes designed to handle sheets up to 7" or 14" in width. Other sizes made to order.

Input speeds range from 10 to 125 feet per min. depending on material and size of cube desired.

The CUMBERLAND Rotary Chopping and Dicing Machine



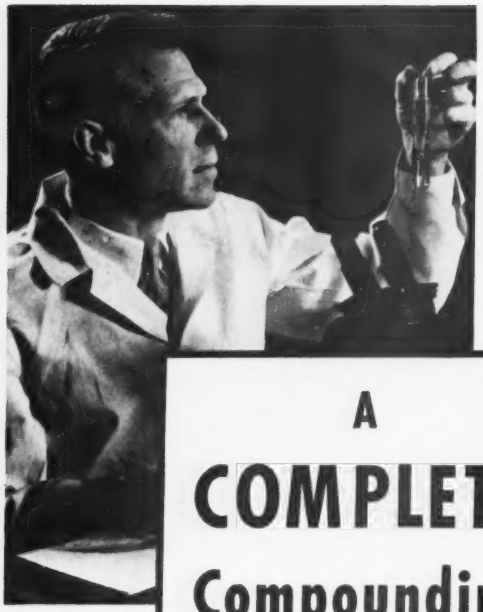
As a chopper, this machine efficiently cuts rubber and vinyl slabs into small pieces. Two sizes available to handle stock widths up to 14 or 24 inches.

As a dicer in modified form, handles principally vinyl sheet stock. A less expensive machine though less universal than the "Stair-Step" Dicer shown above.

For Granulating Plastic . . .
Investigate Cumberland's complete line of granulating machines. Request Bulletin 251

Write for Complete Information

CUMBERLAND Engineering Co. Inc.
DEPT. 3 · BOX 216 · PROVIDENCE · RHODE ISLAND
Builders of Better Machines for the Rubber and Plastics Industry



A
COMPLETE
Compounding
Service
FOR
EMULSIONS • SOLUTIONS
and HOT MELTS . . .

YES, ARCCO offers you a complete compounding service. While offering you a wide range of completed formulations, ARCCO will be glad to develop and compound special formulas to meet your individual needs. All compounds are designed to meet rigid customer specifications based on specified tests in the ARCCO Laboratories.

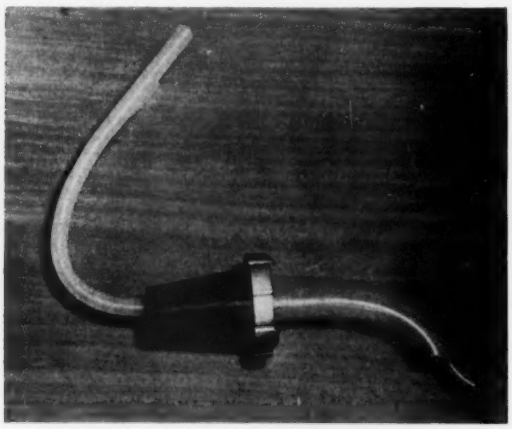
If you wish greater water, heat or abrasion resistance in air drying or curing formulations, you need only to call for ARCCO Technical Service. Our present available formulations include such specialties as heat seal coatings, plastisols, organosols and laminants for vinyl films.

Whether your business is Textile, Rubber, Leather, Paper, Plastics, Automotive or Chemical, ask for an ARCCO engineer. He will be happy to work with you.

ARCC
AMERICAN RESINOUS
CHEMICALS CORPORATION
RESIN EMULSIONS, SOLUTIONS AND HOT MELTS FOR ADHESIVE BASES, BINDERS, COATINGS, SIZES AND SATURANTS
GENERAL OFFICES: *103 FOSTER STREET, PEABODY, MASSACHUSETTS*
IN CANADA: American Resinous Chemicals of Canada, Ltd., Toronto, Canada

General Scientific Pouring Spout

General Scientific Equipment Co., 2700 West Huntingdon St., Philadelphia 32, Penna., has introduced the "SO", a new type of pouring spout for small containers. It is designed to prevent accidents and save materials,



caused by spilling, splashing and carelessness in pouring liquids into smaller containers. The unit is made of acid-resistant rubber and plastic tubing and will fit bottle openings from to 1⅜ inches. It has a flow capacity of slightly more than 1 gallon per minute.

Koroseal Air Mattress

A new air mattress made of Koroseal has been announced by the B. F. Goodrich Co., Akron, Ohio. Designed after the type of mattresses used by the armed services, the new air mat is said to be ideal for sun bathing, surf riding and camping. It can even double as a spare mattress for the home. The air mat is 74 inches long and 24 or 33 inches wide. It is made up of six tubes with two separate air chambers and two valves for inflation and deflation. The mat is emerald green on one side and bright yellow on the other. When used as a surf mat, the two separate air chambers make the Goodrich mat one of the safest that can be used in water. Seams of the air mat are electronically welded and will not burst under ordinary pressure, the company states. The air tubes also act as an insulator against cold and dampness from the ground and provide maximum comfort for hunters and campers.

Solvent Handling Hose

A new solvent-handling hose with high resistance to methyl ethyl ketone, acetone, methyl acetate and other alcohols and esters of petroleum has been announced by Hewitt-Robins Inc., Stamford, Conn. The new hose utilizes a Thiokol tube and a heavy-duty tank-car type construction, making it serviceable for suction applications as well as simple discharge. The hose will have particular use in the metal-working and paint and varnish fields to transfer coolant oils, metal cleaning fluids and paint solvents from tank cars to factory storage. The hose is available in single 50 foot lengths in three diameters—2, 2½, and 3 inches—with a production delivery of about 45 days, although the company plans soon to make limited quantities of all three sizes available for immediate shipment.

DEPENDABLE PERFORMANCE YOU CAN RELY ON

now!

100% FLOWABLE SYNTHETIC RUBBER, AS WELL AS DEPOLYMERIZED NATURAL RUBBER

100% RUBBER SOLIDS IN LIQUID FORM

TRADE MARK

DPR®

TECHNICAL LABORATORY INFORMATION AND SAMPLES UPON YOUR REQUEST

ORIGINATORS OF QUALITY DEPOLYMERIZED RUBBERS "SINCE 1906"

DPR, INCORPORATED
A Subsidiary of H. V. HARDMAN CO.
571 CORTLANDT STREET
BELLEVILLE 9, N. J.

IN PROCESSING RUBBER PRODUCTS

Viscosity *ok* is Key

TO BETTER DIPPING, LEVELING, BRUSHABILITY and SPRAYABILITY

With a Brookfield Viscometer on the job, you just flick a switch, read the dial and have your determination directly in centipoises. Flow characteristics upon which the quality of your product depend can be studied with slide-rule speed.

High accuracy *plus* high sensitivity are inherent in the Brookfield principle of operation — direct indication through a calibrated spring of the torque on a rotating spindle.

Rheograms of rubber solutions obtainable with a multispeed Brookfield Viscometer can be correlated to conditions of mastication, plasticity of milled rubber, physical conditions of solid compound and nature of solvent.

Ideal for use both in Labs and at points-of-process, Brookfield Viscometers are portable and plug into any ac outlet. Send for fully illustrated 1954 catalog listing all models and accessories. Write today to Dept. R.

Brookfield ENGINEERING LABORATORIES, INC. Stoughton, Mass.

"Factice"

THE STAMFORD RUBBER SUPPLY CO.

"Vulcanized Oil"

THE SEAL OF DEPENDABILITY

Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also to our hydrocarbon solutions of "Factice" for use in their appropriate compounds.

Continuing research and development in our laboratory and rigid production control has made us the leader in this field.

The services of our laboratory are at your disposal in solving your compounding problems.

Oldest and Largest Manufacturers of "Factice" Brand Vulcanized Oil Since 1900

(Reg. U.S. Pat. Off.)

THE STAMFORD RUBBER SUPPLY COMPANY

Stamford, Conn.

Accuracy in test results is greatly increased in the new DMC Weather-Ometer by a positive control of specimen temperatures.

A constant volume of air at a controlled temperature in the heavily insulated cabinet, maintains uniform predetermined specimen temperatures regardless of variations in room conditions.

Automatic control of humidities up to dew point is available as optional equipment.

All automatic controls including complete voltage controls are located on the front panel of the Weather-Ometer directly above the door of the test chamber.

Both horizontal and vertical testing is available. Shallow containers are used for semi-liquid materials and vertical panels for solid materials.

Source of radiation is two Atlas enclosed violet carbon arcs.

Complete technical information on the DMC model and other Weather-Ometers is contained in the new Weather-Ometer catalog. A copy will be mailed on request.

ATLAS ELECTRIC DEVICES CO. • 361 W. Superior St. • Chicago 10, Ill.

Manufacturers of accelerated testing equipment for over a quarter of a century.

Silicone-Fiberglas Connector

Aircraft engineering attention recently became sharply focused on a new silicone rubber-fiberglas duct connector which was granted CAA approval as an acceptable replacement for metal bellows units in aircraft engine supercharger inlet ducts. The new flexible connector, developed by Arrowhead Rubber Co., Long Beach, Calif., withstands compression, expansion and misalignment, and at the same time offers greatly improved resistance to high pressures and to operating temperatures from −100° to 700°F. and higher. Because of its greater flexibility under all conditions, the silicone-fiberglas connector successfully withstands the effects of vibration and torque motions which in many instances have caused premature failure of metal bellows, the firm states. Fabricated from material designated by Arrowhead Rubber as "ArcoSil," the new duct connector offers considerable saving in weight, is comparatively low in cost and due to its exceptional flexibility can be easily installed.

Canner's Conveyor Belt

A new, improved canner's conveyor belt, used for all kinds of food handling, has been announced by the Goodyear Tire & Rubber Co., Akron, Ohio. Without affecting its basic characteristic of not imparting taste or odor to food products, the company is said to have compounded a tougher rubber cover that improves the specialty belt four ways. Final laboratory tests show that the new sanitary service belt has 30 to 35% more abrasion resistance and its elasticity has been increased more than 25%. The new belt has 12% more resistance to tearing and its tensile strength has been increased up to 100%. Belts with white or tan colored rubber covers average 40% more tensile strength, while the black cover compound belt has an average of 100 per cent more tensile strength. Former characteristics of stain, acid and mildew resistance in the old product have been maintained in the new, the company declared.

Giant Press Pad

The Industrial Products Division of the Goodyear Tire & Rubber Co., Akron, Ohio, has just completed a press pad that is believed to be the world's largest fully-molded rubber part. Weighing 1,120 pounds, the specially-compounded rubber pad will be installed on a press used to form huge aircraft parts. It measures more than five feet wide and thirteen feet long. Designed to operate under pressure of 10,000 pounds per square inch, the rubber pad will go into a direct acting hydraulic press. An ordinary press pad operates at approximately 2,000 pounds per square inch of pressure. The prototype of the giant aircraft part press was completed in 1952. A diaphragm deforms the rubber press pad to shape the metal parts.

Oak Rubber Crib Toys

An all-rubber "Lamb," "Cat," "Elephant" and "Bear" are the newest additions to the popular "Squeeze-Me" toy line of the Oak Rubber Co., Ravenna, Ohio. Infant's toys, they whistle softly when squeezed. Each toy is painted with waterproof colors and made of natural rubber, including the whistle. Oak Rubber says that the whistle will not come out easily, bend or rust.

NCP

The National Chemical and Plastics Co.

Manufacturers of quality lacquer products for industry, equipped to fill your lacquer needs quickly and economically.

Rubber Lacquers

CLEAR AND COLORED

- NEW, improved LACQUERS for Rubber Footwear, or any rubber product where lacquer is used as a pre-cure coating.
- SOLE and HEEL LACQUERS. Eliminate seconds by using our special pigmented lacquers. Can be supplied in any color desired.
- NCP 1909. An anti-tack coating. Spray or brush it on any tacky surface where powder is normally used to kill tack before cure.
- CASUALS, footwear. NCP 1909 is an excellent dulling and anti-tack agent on edges of soles or crepe wrappers used in the manufacturing of casual type footwear.
- SPECIAL lacquers for all types of rubber products.

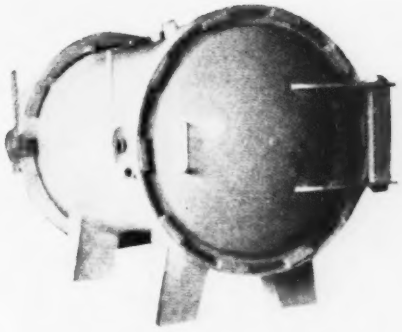
Write for complete details

The National Chemical and Plastics Co.
Dept. RA • 1424 Philpot St. • Baltimore 31, Md.

THARCO

The ONLY Quick Opening Safety Door that can use a TEFLON Gasket.

Over 2300
Now in use



ASME CODE APPROVED

TEDD HARRIS CO., INC.

27 Fredericka Street, North Tonawanda, N. Y.
Phone: Jackson 5367

BRATEX

RUBBER HOLLAND

7 POINTS OF SUPERIORITY

AVAILABLE IN ALL STANDARD QUALITIES

Write for SAMPLES and prices

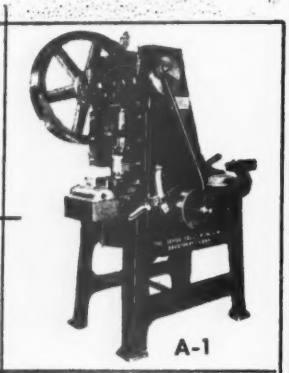
BRATEX is available in three standard qualities, 20 and 40 inch widths, 100 and 250 yard rolls. Special size rolls to order.

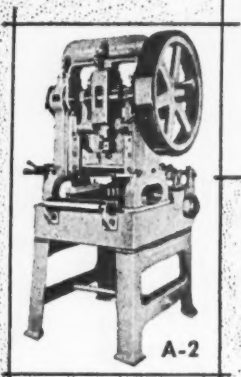
THE HOLLISTON MILLS, INC.

Norwood Massachusetts

COULTER

THE KEY TO HIGHER QUALITY CUTTINGS



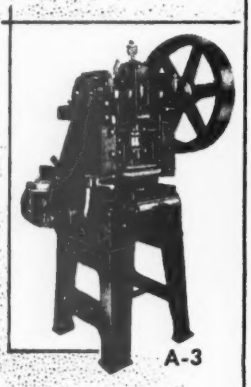


MODEL A-1
Cutting Heels at high speed production or short runs.

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.



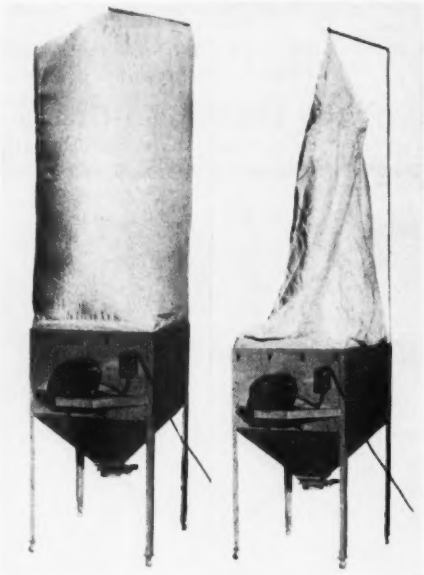
Since 1896
coulter production machines
HAVE MEANT MORE IN HIGHER QUALITY CUTTINGS . . . MORE IN GREATER PRODUCTION.

the James COULTER Machine Co.
BRIDGEPORT, CONN.
BRIDGEPORT - CONNECTICUT

NEW EQUIPMENT

Goodman Model 400 Dust Collector

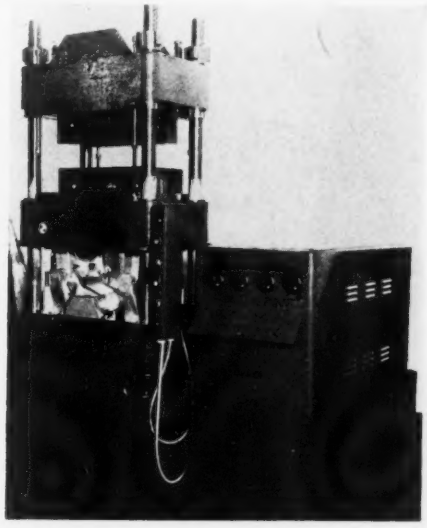
Several important improvements have been incorporated in a new dust collector developed by G. F. Goodman & Son, Richmond St. and East Columbia Ave., Philadelphia 25, Penna. Called the Goodman Model 400 Dust Collector, the new model has a 4-inch diameter intake connection, a 4-inch diameter cleanout equipped with a quick slide blast gate which is 13 inches above the floor line, a nylon dust bag measuring 24 x 24 x 60 inches with an effective surface of 44 square feet, a totally-enclosed ¼ h.p., 3450 rpm ball bearing motor, and a manual starting switch. It is of welded steel construction with ball feet to facilitate moving about, weighs 143 pounds, is 25 inches wide, 38 inches long, and 104 inches high, and comes equipped with 6 feet of 4-inch diameter flexible metal suction hose and 10 feet of rubber-covered electric cord. Suction is generated by a Torrington Airotor, with a capacity of 400 c.f.m. with a clean bag and 360 c.f.m. with a loaded bag.



Features of the new dust collector include powerful sustained suction, extremely quiet operation, easily moved about, little maintenance since it has only one moving part, trapped dust is easily removed, requires relatively little floor space, the nylon dust bag is reinforced with heavy canvas at the box junction and is clamped in place by wing nuts, and it is designed for continuous operation. Approximately 14,000,000 tiny openings allow the air to escape but trap the microscopic dust particles. When the unit is put into operation, the dust laden air is discharged upward, inflating the bag. This flow is directed against one interior side of the suspended bag and produces a vigorous ripple. This constant movement prevents the bag from loading too rapidly. When the bag becomes loaded the motor is shut off and the bag allowed to collapse. As the bag collapses, the dust particles are shaken free and drop into the hopper.

Standard 150-Ton Compression Press

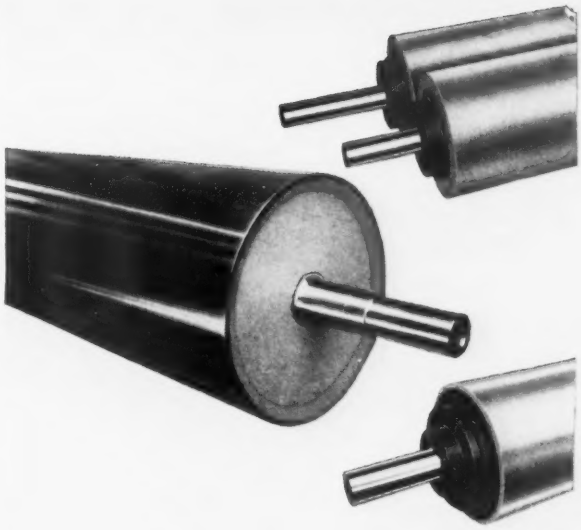
Standard Machinery Co., Mystic, Conn., has added a 150-ton compression molding press to its line. Like other presses featured by the company, the new press is of the toggle type and enables the user to obtain 150-ton pressure from a 3 h.p. motor. Features provided by the new unit are said to offer users greater molding



speed, more accurate sequence timing, quieter operation, lower maintenance, and longer press and mold life. Among these are: use of differential cylinders for both compression and plunger molding; incorporation of a one-piece piston and piston rod, of 5-inch diameter; new type toggles and bearings consisting of one-piece steel castings; heavier side rods; automatic lubrication of ram and toggles; an 8-inch stroke, with ejection provided for both top and bottom platens; use of cushioning valves for the main and/or transfer cylinders at both ends of the stroke; a new control panel so designed that each operation can be individually dialed without manual compensation of the other timing cycles as is necessary in other controls; two-second opening and closing, and increased press speed. Automatic ejection is also available as an accessory. Sole selling agent for the new Standard press is the Davis-Standard Sales Corp., also of Mystic, Conn.

Presses for Resin-Reinforced Plastics

A new line of presses suitable for the accurate production of resin-reinforced plastic products has been announced by the Adamson United Co., Akron, Ohio. Present designs range from 84 x 168-inch platen size with 138-inch stroke to a smaller sized 48 x 48-inch unit with 78-inch stroke. A special cylinder arrangement on the new presses provides a rapid traverse feature, permitting closing and opening speeds of 300 to 400 inches per minute, controllable over a 12-inch travel. All of the presses are designed for a unit pressure of 100 psi over the entire platen area. The company guarantees the presses will not exceed allowable deflection standards set up by the J. I. C. of .001-inch deflection per foot of platen length.



Shaf-Tite® Rolls
for the
RUBBER INDUSTRY

Rodney Hunt Shaf-tite Rolls are widely used because of their reputation for long wear and low maintenance. Patented constructions of great strength adapt these rolls to the specific demands of many jobs. Rodney Hunt roll types include . . .

STEEL PIPE ROLLS
STEEL TUBE ROLLS
STAINLESS STEEL TUBE ROLLS
CHROMIUM PLATED ROLLS
BRASS TUBE ROLLS
ALUMINUM ROLLS
COOLING ROLLS
CONVEYOR HEAD AND TAIL ROLLS
WOODEN ROLLS
RUBBER CARRIER ROLLS
RUBBER SQUEEZE ROLLS
STAINLESS SQUEEZE ROLLS
TENSION SNUB ROLLS
SPIKE ROLLS
FRICTION SURFACE ROLLS
GROOVED STEEL ROLLS
PLASTIC ROLLS
SPREADER ROLLS

FREE! Send for comprehensive catalog on Shaf-tite Rolls. Includes roll engineering data, suggestions for increasing roll life, and inquiry data sheets. Rodney Hunt Machine Co., 37 Maple St., Orange, Mass., U. S. A.

RODNEY HUNT®

INDUSTRIAL ROLL DIVISION

Manufacturing Engineers Since 1840

TESTED IS TRUSTED

Rapidly increasing adoption of the Scott-NBS Mooney Viscometer has brought the total to

more than 500

in world-wide use by the Rubber Industry for rapid and accurate determination of Scorch and Cure characteristics.

REQUEST "NBS LITERATURE"

SCOTT TESTERS

**Registered Trademark*

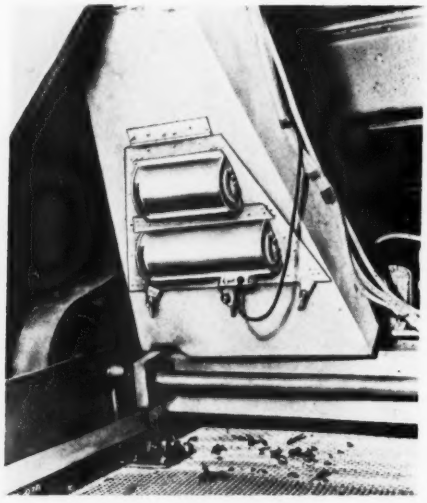
SCOTT TESTERS, INC.

85 Blackstone St., Providence, R. I.

Standard of the World

Warning System for Magnets

The perfection of a unique and completely automatic alarm system which dramatically enhances the efficiency and usefulness of magnetic separators by virtually eliminating the possibility of human error has been announcd by the Eriez Manufacturing Co., Erie, Penna.



The new control, called Magnalarm, is said to set revolutionary operating standards for magnetic separators in the rubber industry by assuring the maintenance of such separators at peak efficiency. The new control does its "thinking" by means of a sensitive ferrometer which constantly measures the quantity of tramp iron as it accumulates on the magnet's surface, and which reacts on a circuit to trip the alarm as soon as a predetermined accumulation is reached. Standard types of alarms are optional as is the location of the alarm. The small amount of current required to operate the Magnalarm warning system in no way affects the magnetic field of the separators. The accompanying illustration shows the installation of an Eriez double-row Magnalarm on the rubber reclaiming line ahead of the sizing screens in the plant of the Continental Rubber Works in Erie, Penna.

Bristol Oven Control Packages

Complete control packages, individually designed for specific furnace, oven, kiln or dryer applications, are now available from the Bristol Company, Waterbury, Conn. Ten separate packaged systems are offered, enabling a designer with a particular heating problem to select a complete control system engineered to satisfy his particular requirements. They can be used for automatic control of any heating application. These Bristol-Beck control packages are designed to operated on-off or proportional fuel valves or electric contacts, in a variety of control systems, including proportional, proportional-input, on-off, or time-program; automatic reset is also available. They include all components necessary for a complete installation, including a Bristol Dynamaster Pyrometer, a Beck Relay or Putmo Controller, and a Beck Motor Operator.

Hydrocarbon

M.R.

GRANULATED

CRUSHED

SOLID

TUMPEER CHEMICAL CO.
333 NORTH MICHIGAN AVENUE
CHICAGO 1, ILLINOIS

NEW! FOR LATEX COMPOUNDERS

A COMPLETE SERVICE

- ANTIOXIDANT DISPERSIONS
- ACCELERATOR DISPERSIONS
- PIGMENT DISPERSIONS
- SULPHUR DISPERSIONS
- ANTI-TACK AGENTS
- ZINC OXIDE DISPERSIONS
- DEFOAMERS
- TACKIFIERS

Our Laboratories will be pleased to suggest complete formulations to solve your specific problems in coating, impregnating, laminating, rubberizing, dipping, molding and adhesives.

RUBBA INC.
1015 E. 173rd ST.
New York, N.Y.

VULCACURE*

AQUEOUS SUSPENSIONS OF ULTRA ACCELERATORS,
BY A NEW PROCESS, FOR LATEX COMPOUNDING

VULCACURE ZM
50% Zinc Dimethyldithiocarbamate

VULCACURE ZE
50% Zinc Diethyldithiocarbamate

VULCACURE ZB
50% Zinc Dibutyldithiocarbamate

VULCACURE NB
47% Sodium Dibutyldithiocarbamate

PROVEN PRACTICAL AND ECONOMICAL

PARTICLE SIZE BETTER THAN FORTY-EIGHT HOUR BALL MILLED DISPERSIONS

•

Our sales and technical staffs are at your disposal

*Registered Trademark

ALCO OIL & CHEMICAL CORPORATION
TRENTON AVE. and WILLIAM ST., PHILADELPHIA 34, PA.

NEW ENGLAND OFFICE
Alco Oil & Chemical Corp.
610 Industrial Trust Bldg.
111 Westminster St.,
Providence 3, R. I.
Phone: ELmhurst 1-4559

ABRASION TESTER

- SIMULATES ACTUAL WEAR CONDITIONS
- FOR RUBBER, PLASTICS, PAINT and FLOOR COVERINGS
- GIVES ACCURATE NUMERICAL REPORT

The Model 140 Taber Abraser is recognized the world over as the STANDARD METHOD for testing the wear resistance of rubber, plastic and composition materials. Anyone in your plant can make a scientific, wet or dry, comparative abrasion resistance test with this instrument. You merely insert sample of material to be tested and then take reading from numerical dial.

NOW, YOU CAN ACCURATELY TEST THE ABRASION RESISTANCE OF:

★ TIRES
★ FLOOR TILES
★ RAINCOATS and BOOTS
★ RUBBER MATS
★ MECHANICALS
★ PROTECTIVE COATINGS

Test your new developments against competitive materials in a matter of minutes. When you know the facts you will be able to create savings that will pay for this inexpensive piece of test equipment many times over.

MAIL COUPON FOR FREE LITERATURE

Taber INSTRUMENT CORPORATION SECTION
111 Goundry St., North Tonawanda, N. Y. 32

Please send me illustrated folder containing all the facts on the Taber Abraser.

NAME .....
COMPANY .....
ADDRESS .....
CITY ..... ZONE ..... STATE .....

Testing Unit for Heat Variation

Such materials as rubber, plastics, adhesives, etc., often have entirely different elongation properties and breaking points when subjected to heat, and an original method was recently devised by one of the universities concerned with government research to ascertain exactly what changes occurred under such conditions. The testing unit devised utilized a specially designed chamber made of

insulating board. As is shown in the accompanying photograph, a Dillon Model L Universal Testing Machine was equipped with an electrically-heated cabinet, temperature checked with a pyrometer. The specimens to be tested were placed inside the cabinet with the ends passing through narrow slits at the top and bottom, and secured by gripping fixtures on the outside. Predetermined heats were then applied, and pull was simultaneously exerted by the testing machine. The Dillon Tester shown was made to the customer's exact requirements having extra tall pressure columns and side width. Capacities of from 0-250 lbs. up to 0-10,000 lbs. are available either hand or motor operated. All will handle tensile compression, transverse or shear tests. In addition to heat cabinets, water chambers and cold cabinets may also be used with the tester. The Dillon Tester is made by W. C. Dillon & Co., Inc., of Van Nuys, Calif.

Improved Gyroseal Valves

Re-christened "Gyroseal," the Richmond Foundry and Manufacturing Co., of Richmond, Virginia, is now producing its new and improved version of the famous Ostlind Valve. Gyroseal Valves eliminate the causes of valve failure by causing the disc to rotate rapidly at the moment of closure. Foreign particles are thrown off by centrifugal force and the turbulence created keeps the particles in suspension while the disc is gently polished against the seat. Far stronger yet simpler in construction than the original valves having this feature, Gyroseal Valves last longer, need less repair and are simple to repack. Gyroseal Valves cut down-time by eliminating leakage, unbalanced flow, spalling, wire drawing, chattering, sticking and the necessity for regrinding or replacing disc and seat.

Now . . . Up-To-The-Minute

INTERNATIONAL TECHNICAL ASSISTANCE

- To tire and other rubber manufacturers abroad, who desire to learn the latest American "Know-How" . . . cut manufacturing costs—we offer comprehensive Technical Assistance at low cost.
- Dayton Rubber's I.T.A. plan has been in existence for 20 years. Rubber experts and teachers that give unexcelled technical assistance at a surprisingly nominal cost . . . all backed by 48 years of recognized leadership in the rubber industry . . . with 4 U. S. plants.
- We train your personnel in these modern plants . . . help you establish the latest formulae for processing natural and all new types of synthetic rubbers and textiles . . . latest "Know-How" in Tubeless Tires, Butyl Tubes, Rayon and Nylon Cords, Carbon Blacks. We also design factories and supervise machinery installations if desired.

Write: International Technical Assistance Division

I.T.A. INTERNATIONAL TECHNICAL ASSISTANCE DIVISION THE DAYTON RUBBER CO. DAYTON, OHIO

Dayton Rubber

Dayton 1, Ohio, U. S. A.
Cable Address: Thorobred

SINCE 1905, MANUFACTURERS OF TIRES AND TUBES

MICA

POWDERED

ALL GRADES & TYPES
for the
RUBBER INDUSTRY
Water and Dry Ground

Also: Stearates, Magnesium Oxides, Elk Brand Antimony Oxide, Pumice, Phthalocyanine Blue, Clays, Talc, All Oxide Colors, Whiting Fillers.

Send For Complete Products List.

WHITTAKER CLARK & DANIELS, INC.
RUBBER MATERIALS DEP'T B
260 West Broadway
New York 13, N. Y.
CANADIAN REPRESENTATIVE
Richardson Agencies, Ltd. 454 King Street W. Toronto

HYDROCARBON

PANAFLEX ...EP-1

PLASTICIZERS

A LOW COST PLASTICIZER OIL

for Rubber Compounding

PROPERTIES
Low Specific Gravity — Dark Viscous Liquid
Extremely High Boiling

FOR
Improved Processing — Improved Electrical Characteristics
Minimum Effect on Cure — Better Tear Resistance
Extending Vulcanizates

EXCELLENT COMPATIBILITY WITH
GR-S Rubbers—All Types — Buna N Type Rubbers
Neoprene Rubber

AVAILABILITY
Basic Producer — Tank Car or Drums
Warehouse Distribution

PAN AMERICAN CHEMICALS

PAN AMERICAN Chemicals
DIVISION
Pan American Refining Corp.
122 EAST 42ND STREET · NEW YORK 17, N. Y.

The close attention to detail in every production step at National is combined with our more than forty years experience in roll making and the metallurgical skill of our research and production staff to give you durable, dependable National Rolls.

The best proof of their dependability is their performance in *your* stands. Why not try them and see.

NATIONAL ROLLS

THE NATIONAL ROLL & FOUNDRY CO.
Avonmore, Pennsylvania

•

SPECIALISTS IN IRON, ALLOY IRON AND STEEL ROLLS AND CASTINGS
NI-HARD • NI-RESIST • DUCTILE CAST IRON

REVIEWS

BOOKS

Organic Coating Technology. Vol. I. Oils, Resins, Varnishes and Polymers. By Henry Fleming Payne. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9 in. 674 pp. $10.00.

This book, together with Volume II which is in preparation, is intended for students in paint courses and for new employees in the oil, resin, pigment and paint industries, and is based on lecture courses given by the author at the Polytechnic Institute of Brooklyn. It also serves, however, as a refresher course for experienced personnel in these industries and in a sense may be regarded as a manual on organic coating technology. The author, who is also associated with the American Cyanamid Co., is much too modest in his personal analysis of the book.

Volume I provides a balanced treatment of the entire subject of organic coatings. It surveys the chemistry, manufacture and use of oils, resins, varnishes, high polymeric materials, plasticizers and driers used for clear coatings, and as the vehicle or liquid portion of pigmented coatings. Although the author has included a compact discussion of basic theory, sufficient to provide an understanding of the many physical and chemical phenomena associated with the drying of oils, the resinous state, and the production and behavior of high polymers, emphasis throughout the book is on the practical aspects of the subject. A large number of specific formulations is included showing the actual use of the materials discussed. Formulations are based on commercial materials which are referred to by their trade names for easy identification.

No work associated with modern day paints would be complete without specific reference to rubber and accordingly a 27-page chapter is devoted to "Rubber Resins," the term being used to cover not only such modifications of natural rubber as cyclized rubber, rubber hydrochloride and chlorinated rubber, but the resins and latices which are modifications of synthetic rubber as well. The chapter includes a table listing various types of commercial synthetic resin latices which are currently available and formulations for latex paints made with Dow Latex 762-W. Procedures for producing these paints are also given. Further details regarding the use of latices in paints are promised by the author in Volume II.

The book has 15 chapters in all and a cross-referenced subject index. Each chapter has a special introduction and is marked by the inclusion of a statement or phrase intended to make the reader more fully conscious of the important role he occupies in the over-all scheme of things.

•

Pioneers of Progress. Published by the Putnam Publishing Co., 111 East Delaware St., Chicago 11, Ill. 12 x 12½ in. 48 pp. $5.00.

Emphasizing the fact that "teams" rather than individuals are responsible for recent strides in science and industry, this book, issued in a limited edition, pays tribute to the technical and business leaders behind recent major technical developments, all of which were originally featured in Chemical Processing Magazine during 1953. The stories behind these developments are reproduced in full, making the book both a reference item and a collector's item. The companies honored include Carbide & Carbon (coal hydrogenation), Monsanto Chemical (Krilium), DuPont (functional synthetic fibers), Charles Pfizer (moulds), Dow Corning (silicones), Shell Chemical (synthetic glycerine), Owens-Corning (Fiberglas), and American Cyanamid (Melamine). In the case of Dow Corning, special tribute is paid to Dr. William R. Collings, vice-president and general manager, and a group of 13 associates. The text portion describes the history of this relatively new company and makes reference to some of the applications of the silicones, including silicone rubber.

BOOKLETS, CATALOGS, etc.

Goodrich Elevator Belting. B. F. Goodrich Co., Akron, Ohio. 8½ x 11 in. 24 pp.

This engineering handbook on elevator belting describes and illustrates types of belt bucket elevators, gives factors for belt selection, outlines procedures for engineering the correct belt, and describes belt construction features. Included in subjects covered in a section devoted to belt installation are bucket spacing and belt punching, minimum bucket spacing, bucket punching dimensions, tables of standard buckets, methods of belt splicing, elevator belt take-up and pulley lagging. Convenient data tables refer to weights of materials handled, holding properties of various fabrics, determining belt weight and thickness, drive factors, sines of elevator slope angles, belt speed, belt plies needed for tension requirement, pulley diameters, belt quality and cover thickness. Also included is a suggested specifications form listing required engineering information helpful in ordering elevator belts.

•

Ethylene Oxide, Ethylene Glycol and Diethylene Glycol. Nitrogen Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. 8½ x 11 in. 33 pp.

This bulletin fully describes ethylene oxide, ethylene glycol and diethylene glycol, giving their uses, chemical and physical properties, handling and storage features, and safety precautions. The behavior of each of the materials with other chemicals is portrayed by complete reaction formulas. The bulletin also gives complete analytical procedures to follow to determine color, odor, acidity, impurities, boiling range, specific gravity, etc., for each chemical. Illustrative matter includes charts showing equipment for unloading tank cars and graphs pertaining to safety, humectant valves, dew points, specific gravity, vapor pressure and other characteristics.

•

Protection with Parlon. Hercules Powder Co., Wilmington 99, Del. 8½ x 11 in. 24 pp.

Thirty-five case histories of the successful use of protective coatings based on chlorinated rubber are included in this new booklet. Water and sewage works, paper mills, storage tanks, and chemical and food processing plants are among the installations from coast to coast where Parlon-based coatings have been photographed after long-term exposure to a variety of corrosive elements. Also included in the booklet are performance data on Parlon finishes and instructions for applying Parlon paints by brush or spray to metal, wood, and various cement and asphalt surfaces.

•

Proportioning with Select-O-Weigh. (Bulletin No. 0351). Richardson Scale Co., Van Houten Ave., Clifton, N. J. 8½ x 11 in. 6 pp.

This bulletin describes the company's recently developed proportioning and materials handling system for automatically making up formulated mixes of bulk products. It explains the operation of the electronic control system, discusses rates and accuracies, and goes into the possibilities of remote recording. Also explained is the actual formulating operation, the selecting, feeding, weighing and mixing. The bulletin is illustrated with photographs and a large schematic drawing.

•

Possibilities with Fatty Alcohols. M. Michel & Co., Inc., 90 Broad St., New York 4, N. Y. 8 x 10¼ in. 8 pp.

This booklet tells how to use "Cachalot" brand cetyl, oleyl, and stearyl alcohols in various applications in the rubber and other industries. Each of the materials is completely described while an interesting flow chart illustrates a typical sulfonation reaction, in this case the sulfonation of fatty alcohol with chlorosulfonic acid.

Fast deliveries plus exceptional performance make EEMCO Mills and Presses your best buy. Save weeks of valuable production time. Some sizes are available for immediate shipment.

MILLS

for processing rubber and plastics, including LABORATORY MILLS for experimental work.

PRESSES

for compression, lamination, transfer and reinforced plastics molding —also LABORATORY PRESSES for experimental work.

EEMCO

ERIE ENGINE & MFG. CO.
12th ST. & EAST AVE., ERIE, PA.

Just found out About...

Rubber-Flo

MOLD LUBRICANT

There are many reasons why so many prominent rubber manufacturers continue to use RUBBER-FLO year after year. Primarily it's because RUBBER-FLO is low in cost, odorless, non-toxic, uniform in quality and keeps molds clean for so long. Test RUBBER-FLO yourself and see!

Also...

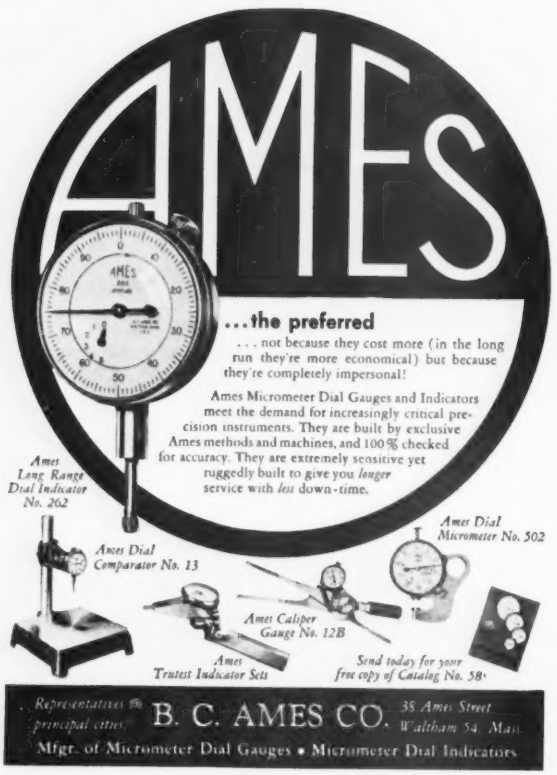
RUBBER-FREE . . . A rubber surface lubricant which prevents uncured slabs from sticking . . . eliminates talc or mica.

RUBBER-SOL . . . Cleans rubber and latex deposits from screens, pipe lines, etc. Also cleans aluminum molds.

DISSOLVA-SOL . . . A highly effective metal cleaner that is low in price. Emulsifies with water.

For Complete Information and FREE SAMPLES, Write . . .

PREVENTIVE MAINTENANCE COMPANY
505 Bostwick Avenue Bridgeport 5, Connecticut


AMES
...the preferred
. . . not because they cost more (in the long run they're more economical) but because they're completely impersonal!
Ames Micrometer Dial Gauges and Indicators meet the demand for increasingly critical precision instruments. They are built by exclusive Ames methods and machines, and 100% checked for accuracy. They are extremely sensitive yet ruggedly built to give you longer service with less down-time.
Ames Long Range Dial Indicator No. 262
Ames Dial Comparator No. 13
Ames Dial Micrometer No. 502
Ames Caliper Gauge No. 12B
Ames Trutest Indicator Sets
Send today for your free copy of Catalog No. 58.
Representatives in principal cities
B. C. AMES CO.
38 Ames Street Waltham 54, Mass.
Mfgr. of Micrometer Dial Gauges • Micrometer Dial Indicators

REVIEWS (CONT'D)

Better Laboratory Planning. Laboratory Equipment Section, Scientific Apparatus Makers Association, 20 North Wacker Drive, Chicago 6, Ill. 8½ x 11 in. 28 pp.

This is a revised edition of a previously issued publication on the same subject and carries a more comprehensive approach to the better planning of laboratories. It includes many new and attractive pictures of laboratories ranging from industrial, college and hospital laboratory layouts to secondary school and research development laboratories. A helpful section of the new booklet is devoted to "Recommended Bidding Practices"—of service to industrial, community, educational and hospital building planners. The section answers many questions on the subject of bidding.

•

A-C Polyethylene as a Lubricant in Vinyl Processing. (Technical Bulletin No. 4). Semet-Solvay Petrochemical Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. 8½ x 11 in. 7 pp.

This new bulletin outlines the lubricating action of "A-C Polyethylene" and presents a comparison between this material and the more common release agents now used in the processing of vinyl sheeting and film, such as calcium stearate and lead stearate. In the formulations tested, both A-C Polyethylene No. 6 and No. 617 were found to be more effective lubricants than other materials tested.

•

Winning the Battle for More Tire Mileage on Passenger Cars. Rubber Manufacturers Association, Inc., 444 Madison Avenue, New York 22, N. Y. 8½ x 11 in. 24 pp.

This publication describes and illustrates common abuses and misuses to which automobile tires and tubes are subjected. It contains many helpful hints for obtaining maximum service from automobile tire equipment. These are detailed in five sections relating to fabric injuries, tread wear, inflation, wheel balance, and inner tube troubles. Proper care of tires, the publication states, can make driving safer, assist in the efficient operation of the car, and save money.

•

Alcohols. (Bulletin No. F-4731). Carbide and Carbon Chemicals Co., 30 East 42nd St., New York 17, N. Y. 8½ x 11 in. 52 pp.

This booklet discusses in detail the 20 alcohols that are now sold in commercial quantities by the company. It has been prepared as a handy reference for people in the chemical industry. Uses and suggested applications for the alcohols, their physical properties, shipping data, specifications, test methods, constant-boiling mixtures, and a list of selected references to these alcohols in the technical literature are included.

•

Roth End-Mounted Chemical Pumps. (Catalog Section 100). Roy E. Roth Co., 2420 4th Avenue, Rock Island, Ill. 8½ x 11 in. 24 pp.

Special designs of regenerative turbine pumps available for chemical service are dealt with in this brochure, which contains an original approach to NPSH (net positive suction head), together with full data on the use of this concept in selecting turbine pumps for chemical service. It also contains a survey and evaluation of a variety of mechanical seals available in turbine chemical pumps.

•

Oil-Tight Push Buttons, Selector Switches, Accessories. (GEA-5779B). General Electric Co., Schenectady 5, N. Y. 8½ x 11 in. 16 pp.

The full line of G-E oil-tight push buttons, indicating lights, selector switches, and accessories is described in this new four-color bulletin. The booklet explains how this equipment operates and where it can be used. Included are cross-section drawings, full-color application photographs, dimension and outline diagrams, and complete ordering information.

·NO MORE TINSEL ·NO MORE WIRES
·NO MORE IMPROVISATIONS

GET RID OF STATIC ONCE AND FOR ALL

INSTALL NEW PATENTED

"MAGIC WAND"

SELF-ENERGIZING INDUCTION TYPE **STATIC NEUTRALIZERS**

WHICH USE STATIC GENERATED ON YOUR MACHINE AS THE NEUTRALIZING AGENT

No expensive high voltage bars, cables or transformers needed . . . No health hazards . . . Simple, amazingly effective . . . Inexpensive, no maintenance . . . No spark hazards, SAFE, does not shock operators nor damage stock.

The higher the charge, the faster the processing speed, the better this neutralizer works. Assures complete, not partial neutralization of static charges to safe levels.

WRITE FOR BULLETIN NO. 125

HERMAN H. STICHT CO., INC. 27 PARK PLACE, NEW YORK 7, N. Y.

THOMASTON Fabrics

A DEPENDABLE SOURCE OF SUPPLY FOR

INDUSTRIAL TEXTILES

FOR THE

RUBBER INDUSTRY

SUCH AS:

TIRE FABRICS • HOSE AND BELT DUCKS • YARNS CHAFERS • THREADS • SHEETINGS • LAMINATING FABRICS DIVERSIFIED COTTON FABRICS. Whatever your needs our Industrial Textile Specialists will be glad to discuss them with you. We solicit your inquiries.

THOMASTON MILLS

Thomaston, Georgia • New York Office: 40 Worth St.
Akron, Ohio Office: 308 Akron Savings & Loan Bldg.

KOPPERS CHEMICALS . . .

Staples in the rubber industry

SYRENE MONOMER may be polymerized with other active olefinic materials to produce a variety of synthetic rubbers and resins having a wide range of desirable properties. Koppers controls its own raw materials for the production of styrene, thus assuring continuity of supply.

RESORCINOL is used for both the preparation of adhesives that assure strong bonds between rubber or synthetic rubber and nylon, rayon and cotton tire cords and the manufacture of conveyor belts, hose, etc.

DI-tert-BUTYL-para-CRESOL has application as an antioxidant in white rubber products. It retards cracking, hardening and loss of strength without discoloring the product or staining materials with which the product comes in contact.

DIVINYLBENZENE (20-25% and 50-60% grades) in synthetic rubber manufacture improves processing and decreases shrinkage of the product. With styrene and other monomers, it produces insoluble and infusible copolymers.

MONO-tert-BUTYL-meta-CRESOL is used in the manufacture of an effective anti-flex cracking agent for rubber and rubber-like materials. The resin obtained by condensation of MBMC with formaldehyde imparts tack to GR-S rubber. For detailed information on any of these products, please write to:

whitewall tires **rubber hose**
rubber boots **rubber molding**
rubber automotive components
grommets, hoses, cushions

KOPPERS®

Koppers Chemicals

SALES OFFICES: NEW YORK · BOSTON · PHILADELPHIA ATLANTA · CHICAGO · DETROIT · LOS ANGELES

KOPPERS COMPANY, INC.
Chemical Division, Dept. RA- 34, Pittsburgh 19, Pennsylvania

FOR EXTRUDERS, PLASTICIZERS, STRAINERS, TUBERS

Only *Xaloy* Liners

MEET ALL OF THE PROBLEMS OF THE RUBBER— PLASTICS INDUSTRIES

PROOF—

Abrasion Resisting Xaloy Cylinder Liners are supplied as standard original and replacement parts by extruder equipment manufacturers

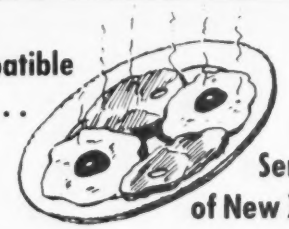
Only XALOY Cylinder Liners assure—

- Absolute maximum service life
- Fast, easy liner replacement
- Exceptional and uniform hardness
- Highly polished liner surface

write for engineering and production data book

Xaloy INDUSTRIAL RESEARCH LABORATORIES
Division of Honolulu Oil Corporation
961 E. Slauson Ave., Los Angeles 11, California

as Compatible as . . . .



the Merez Series (A-B-C-D) of New Zinc Resinates

Leading rubber compounding formulators know that the MEREZ Series of new zinc resinates is so compatible with virtually all resins, drying oils and plasticizers that it actually opens new horizons of formulations and products.

Or—if you are concerned with specified properties not possessed by any standard products, we can tailor-make your zinc resinates.

OTHER PRODUCTS IN OUR LINE

• Limed Rosins	• Rosin Oils	• Solvents
• Pine Tars	• Pine Tar Oil	• Pine Oil
• Burgundy Pitch	• Tackifiers	• Dipentene

For samples and prices of these Glidden Company Naval Stores Division Products write:

THE GLIDDEN COMPANY • NAVAL STORES DIVISION

E. W. COLLEDGE

GENERAL SALES AGENT, INC., JACKSONVILLE 1, FLA.

NEW YORK
52 VANDERBILT AVE.

CLEVELAND
2775 SOUTH MORELAND BLVD.,
AT SHAKER SQUARE

CHICAGO
25 E. JACKSON BLVD.

SAN FRANCISCO
503 MARKET STREET

REVIEWS (CONT'D)

Hot Water Storage Heaters. (Catalog No. 18). Patterson-Kelley Co., Inc., East Stroudsburg, Penna. 8½ x 11 in. 48 pp.

This catalog pictures and describes the complete line of hot water storage heaters produced by the company, and presents useful information on piping arrangements and installation data. Horizontal and vertical heaters in steel, copper-lined, copper-silicon, cement-lined, clad and galvanized construction, as well as the low-flow design, are each cataloged as to weights, dimensions, construction details and capacities—with conversion tables. Listed also are average water requirements of typical hot water fixtures in various types of buildings with examples to show how hot water requirements may be calculated, capacity requirements determined and heaters specified.

•

Sodium Dispersions. U. S. Industrial Chemicals Co., 120 Broadway, New York 5, N. Y. 8½ x 11 in. 30 pp.

Sodium dispersions, their properties, preparation and industrial application are reviewed in this booklet. It reviews developments over the past three years, and enlarges upon the first technical bulletin on sodium dispersions presented to the industry. The new booklet includes convenient techniques for preparing sodium dispersions, diagrams of equipment used in preparation, dispersion formulations with tables, typical methods for using formulations, illustrations of sodium preparation and shipment, and sodium dispersion preparation and handling. It also includes sections on handling procedures, analysis of sodium dispersions, availability and a bibliography.

•

Rubber Processing and Equipment. J. H. Day Co., 1145 Harrison Ave., Cincinnati 23, Ohio. 8¾ x 11½ in. Approximately 82 pp.

This publication is a composite of text material on general rubber processes and data sheets which give complete specifications on Day equipment for the rubber industry. The booklet explains the applications of sifters, mixers, kneading machines, blenders and roll mills in the following categories: (1) Processing of reclaimed rubber; (2) Production of pigments for addition to rubber solutions; (3) Rubber cements and adhesives, and (4) Rubber compounds, such as those combined with asphalt, waxes and similar products.

•

Pliovic Vinyl Resins. Chemical Division, Goodyear Tire & Rubber Co., Akron 16, Ohio. 8½ x 11 in. 52 pp.

Laboratory and production experience have provided extensive data on the compounding and processing of Pliovic resins. Significant knowledge regarding the profitable formulation of these resins has also been acquired. This information is presented in this brochure which is intended to serve as a reference or guide in the production of quality vinyl products. The publication also serves as a guide in distinguishing between the different Pliovic resins. Illustrative starting formulations and supplementary data are included in appendices.

•

Acintol Tall Oil Products. Arizona Chemical Co., 30 Rockefeller Plaza, New York 20, N. Y. 8½ x 11 in. 48 pp.

This booklet is offered as a guide to the tall oil and tall oil products produced by the company, a joint enterprise of the International Paper Co. and the American Cyanamid Co. A history of tall oil is provided as are sections devoted to manufacture and chemistry. Some of the products offered, including distilled tall oil, tall oil fatty acids, tall oil rosin and tall oil pitch, are described. An appendix provides an analysis of Acintol products and other interesting data.

a new addition to the famous

RC Plasticizer Family

An Epoxidized Triester Plasticizer of higher than usual molecular weight for outstanding:

1. PERMANENCE! 2. HEAT & LIGHT STABILITY! 3. EASE OF PROCESSING!

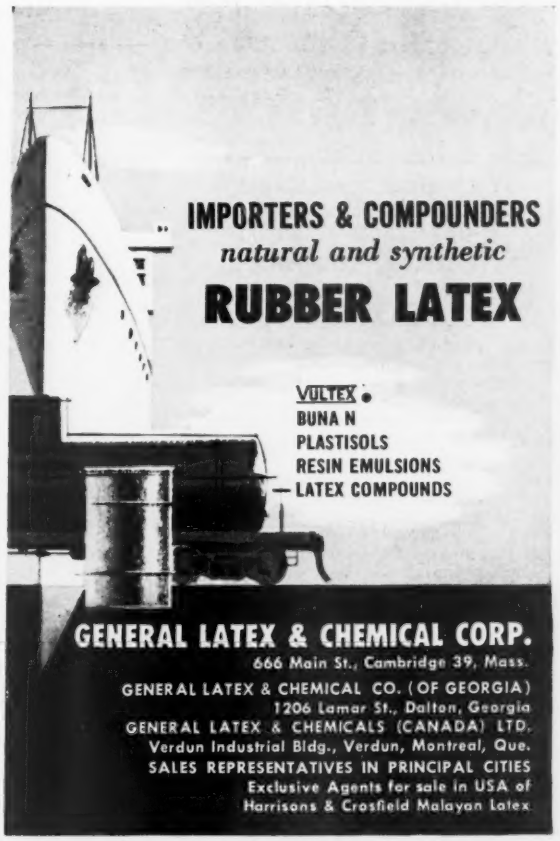
E-S possesses properties of both monomeric and polymeric esters . . . epoxy-oxygen content adds stabilizing action . . . low order of unsaturation assures good aging . . . low viscosity makes for easy handling . . . high molecular weight reduces migration.

Try ***E-S****, now available in drums, for use in:*

Film and Sheeting	Fabric Coatings
Floor Tile	Natural and Synthetic Rubbers
Extrusions	Molded Articles

For FREE Samples and Technical Data Sheets on new E-S and the other famous RC PLASTICIZERS write today to:

RUBBER RC CORPORATION OF AMERICA
274 Ten Eyck Street, Brooklyn 6, N. Y.
SALES OFFICES: 111 West Monroe Street, Chicago 3, Ill.
Little Building, 80 Boylston St., Boston 16, Mass.



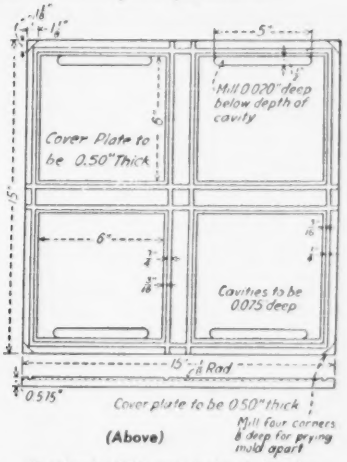
IMPORTERS & COMPOUNDERS
natural and synthetic
RUBBER LATEX

VULTEX •
BUNA N
PLASTISOLS
RESIN EMULSIONS
— LATEX COMPOUNDS

GENERAL LATEX & CHEMICAL CORP.
666 Main St., Cambridge 39, Mass.
GENERAL LATEX & CHEMICAL CO. (OF GEORGIA)
1206 Lamar St., Dalton, Georgia
GENERAL LATEX & CHEMICALS (CANADA) LTD.
Verdun Industrial Bldg., Verdun, Montreal, Que.
SALES REPRESENTATIVES IN PRINCIPAL CITIES
Exclusive Agents for sale in USA of
Harrisons & Crosfield Malayan Latex

HOGGSON
TOOLS, MOLDS AND DIES
For Rubber Testing & Production

Shown here are but a few of the many types of rubber working equipment available. Please submit your problem.


Mill 0.020" deep below depth of cavity
Cover Plate to be 0.50" Thick
Cavities to be 0.075 deep
Cover plate to be 0.50" thick
Mill four corners ⅛ deep for prying mold apart

(Above)

Standard ASTM and Federal dies for cutting test tensile and tear strength samples, and dies for slab curing carried in stock. Write for catalog.

HOGGSON & PETTIS MANUFACTURING CO. • 141A Brewery St. • NEW HAVEN 7, CONN.

MARKETS NEWS-PRICES

NEW YORK, MAR. 5, 1954

Natural Rubber

Since our last report (February 3), the average price of spot rubber on the New York Commodity Exchange has swung in the rather narrow range of 75 points, high for the period being 20.25c reached on February 3, and low being 19.50c reached on March 1. The average price of spot rubber for the month of February was 19.98c based on 18 trading days. This compares with 20.22c in the previous month.

The rubber trade, both in the United States and abroad, is anxiously awaiting the results of the March 4 meeting in Washington, D. C., between government officials and the Rubber Industry Advisory Group on problems of rubber rotation. The general disposition has been to move cautiously and even to lighten commitments pending developments. It is expected that quite a little activity should develop shortly on rotation rubber for April and replacements for the stockpile.

Annual RTA Meeting

At the annual meeting of the Rubber Trade Association held recently in London, England, E. A. H. Peat, chairman, said unless some unforeseen political factor should arise, it seems that the price of natural will continue to be governed for some considerable time, but always within certain limits, by the price of synthetic.

"From a purely market point of view it might be contended that as far as natural rubber is concerned, fair competition and the survival of the fittest would, in the long run, be the best policy. But, having regard to the present economic and political background, not only in Southeast Asia, it seems possible that further attempts to negotiate some form of stabilization scheme may have to be made," he declared.

"Now I have tried to face the facts. I admit that the outlook, at any rate for the near future, is not very bright, but I feel quite sure that natural rubber, properly developed and scientifically produced, can, in the long run, more than hold its own in the field of commerce."

World Rubber Markets

The only pressure on the world rubber markets at this time, and for some weeks, has been on No. 1 R.S.S. The result has been the progressive narrowing in the differences. Any number in the trade feel that the time is near at hand when we may have a reversal in the trend of these spreads.

Some are of the opinion that the narrower differentials have served a two-fold purpose. In the first place, the relative stability in the lower grades has offered a better return to native producers in the Far East. Secondly, the rubber import trade will assume a much healthier tone in that claims will tend to decrease. After all, there will not be the incentive for shippers to "upgrade" rubber with the small premiums prevailing for the better grades.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM FEBRUARY 3 TO MARCH 4

Feb.	Spot	Mar.	May	July	Sept.	Sales
3	20.25	20.15	20.15	20.15	20.15	11
4	20.12	20.15	20.15	20.15	20.15	14
5	20.12	20.05	20.05	20.05	20.05	5
6	....	....	....	....	....	....
7	....	....	....	....	....	....
8	20.00	20.10	19.85	19.85	19.85	6
9	20.00	20.25	20.00	20.00	20.00	4
10	20.00	20.25	20.00	20.05	20.05	25
11	20.25	20.45	20.15	20.15	20.15	27
12	....	....	....	....	....	....
13	....	....	....	....	....	....
14	....	....	....	....	....	....
15	20.00	20.30	19.95	19.95	19.95	23
16	19.88	20.00	19.90	19.85	19.85	21
17	19.88	19.80	19.70	19.70	19.75	16
18	19.88	19.95	19.80	19.80	19.80	16
19	19.88	19.75	19.75	19.75	19.75	25
20	....	....	....	....	....	....
21	....	....	....	....	....	....
22	....	....	....	....	....	....
23	19.75	19.73	19.70	19.70	19.73	33
24	19.75	19.60	19.60	19.60	19.60	47
25	19.75	19.60	19.60	19.60	19.65	18
26	19.75	19.60	19.60	19.65	19.75	13
27	....	....	....	....	....	....
28	....	....	....	....	....	....
Mar.						
1	19.50	19.50	19.40	19.45	19.45	24
2	19.62	19.50	19.50	19.50	19.50	14
3	19.88	19.80	19.75	19.75	19.75	51
4	19.75	19.90	19.65	19.65	19.65	23

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.19$\frac{3}{4}$
March	.19$\frac{3}{4}$
April	.19$\frac{3}{4}$
Thin Latex Crepe:	
Spot	.22
Thin Brown Crepe, No. 2	.17$\frac{1}{2}$
Smoked Blankets	.16$\frac{1}{2}$
Flat Bark Crepe	.14$\frac{1}{2}$

London Market

(Standard Smoked Sheets)

Apr.-June	19.05 - 19.20
July-Sept	19.34 - 19.49

Singapore Market

(Standard Smoked Sheets)

April	17.81 - 17.84

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .500
Butaprene NL	.500 - .510
Butaprene NAA	.540 - .550
Butaprene NXM	.580 - .590
Chemigum 30N4NS	.500 - .510
Chemigum 50N4NS	.500 - .510
Chemigum N3	.580 - .590
G-E Silicone Rubber (compounded)	2.50 -3.60
G-E Silicone Gum (not compounded)	4.00 -4.20
GR-I	—— - .220
GR-S	—— - .230
Hycar OR-15	.580 - .590
Hycar OR-25	.500 - .510
Hycar OS-10	.550 - .560
Neoprene Types AC and CG	—— - .550
Neoprene Type GN	—— - .410
Neoprene Type GN-A	—— - .410
Neoprene Type GRT	—— - .420
Neoprene Type KNR	—— - .750
Neoprene Type Q	—— -1.00
Neoprene Type S	—— - .420
Neoprene Type W	—— - .410
Neoprene Type WRT	—— - .450
Paracril B	.500 - .510
Paracril BJ	.500 - .510
Paracril C	.580 - .590
Silastic (compounded)	1.95 -3.38
Thiokol Type A	—— - .470
Thiokol Type FA	—— - .640
Thiokol PR-1	—— - .950
Thiokol Type ST	—— -1.000

Middling Upland Quotations

	Feb. 2	March 5		
	Close	High	Low	Close
Mar.	34.17	34.40	34.36	34.40
May	34.33	34.43	34.39	34.41
July	34.19	34.39	34.35	34.37

Synthetic Rubber

Many of the demands heard in recent months for an immediate rise in the price of GR-S seem to have died down. The desired effect on natural rubber seems to have been achieved without this action, and, at the moment, natural is selling at prices below that for GR-S. It had long been held in some quarters that once the synthetic plants were sold to private industry, the price of GR-S would rise, almost automatically. Various industry leaders, however, have taken a contrary view stating that under private ownership, prices for GR-S would be sustained if not lowered. It remains, however, for the natural rubber producers to be convinced.

Elsewhere on this page there appear excerpts from a recent address made by E. A. H. Peat, chairman of the Rubber Trade Association of London, on the occasion of a recent meeting. Mr. Peat had some interesting things to say about the natural rubber situation, but he also had some things to say which bear upon prices for synthetic.

Observations on Synthetic

Mr. Peat observed that synthetic lends itself more readily to research than does natural rubber. He noted that in the United States, there are now well over 60 different varieties of synthetic rubber and one great inherent advantage is that these can be specifically produced for any particular form of manufacture as required, whereas natural has to be adapted.

"In looking at the future, I think we must be prepared not only for further improvement in the quality of synthetic but also for simplification in its manufacture. Indeed, there are already indications that the latter is being achieved by the use of oil extending. The U. S. Government sells ordinary GR-S at 23c a pound; by the inclusion of certain oil extenders some types of GR-S are sold at appreciably below this figure. Moreover, current statistics show that the usage of this form of preparation by U. S. industry is rapidly increasing," he declared.

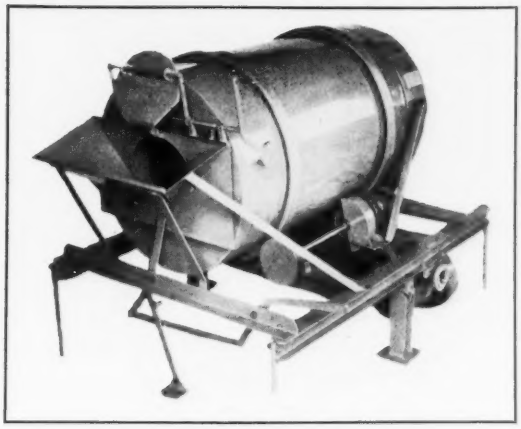
It is difficult to ascribe the recent declines in estimates for production and consumption of GR-S to any one source, especially when one considers that whatever slacks that have developed in the over-all synthetic picture have been taken up by natural rubber. One facet seems to be apparent, however, in that consumers still weigh the matter of price most heavily in choosing one or the other. It is interesting to note that at one time there was a rather considerable call for an increase in synthetic stockpiles. This has abated, due, in great part, to the current pricing structure which exists between natural and synthetic.

Effect Upon Plant Bids

Some quarters are contending that lowered production and consumption for synthetic may have a deleterious effect on bids which may be made for the synthetic facilities being offered for sale by the government. It seems reasonable to assume that with smaller demands being made upon the synthetic facilities, some such circumstance may arise. Others state that such a view would be shortsighted in the extreme, in consideration of the fact that the long-range view of the synthetic industry is excellent. In their view, such relatively minor fluctuations in the supply and demand picture are always of a temporary nature and should not becloud the healthy state of the industry.

WILLS "SUB-ZERO"
ROTARY TUMBLERS

THE INDUSTRY STANDARD



LIQUID CO_2
DEFLASHING RESULTS PROVE STARTLING.
MODELS NOW AVAILABLE TO USE EITHER
SOLID OR LIQUID CARBON DIOXIDE.

FERRY MACHINE COMPANY
WILLS RUBBER TRIMMING DIVISION
KENT, OHIO, U. S. A.
(Export Sales Through Binney & Smith, International)

• CRUDE RUBBER
• LIQUID LATEX
• CHEMICALS

E. P. LAMBERT CO.

FIRST NATIONAL TOWER
AKRON 8, OHIO
HEmlock 4-2188
MEMBER — COMMODITY EXCHANGE, Inc.

Coumarone Resins — Reclaiming Oils — Plasticizers
Powdered Rubber

MARKETS

NEWS-PRICES

NEW YORK, MAR. 5, 1954

Reclaimed Rubber

The trade reports that the reclaimed rubber market has been following closely behind the market for new rubber. Business activity in February was said to have been slightly better than in the previous month, with prices remaining at the same levels. In this field, as in others, the low prices prevailing for natural rubber have, and are expected to continue to have, a checking effect upon the market. It also holds that with the production of new automobiles increasing for spring delivery, the reclaim market will show some gains.

Final figures available for 1953 from the Department of Commerce show that 298,191 long tons of reclaimed rubber were produced in that year, while 282,496 long tons were consumed. The percent of reclaim consumption to new rubber in 1953 was set at 21.1%, against the 22.2% which held for the previous year. Current prices follow:

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14¼
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.12½
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

Activities in the scrap rubber market remain on the slow side, with consumers of scrap still said to be buying on a month-to-month basis. Increased demand noted for black tube stocks within the past few weeks has slackened off, while light colored carcass and Butyl tubes are holding steady.

The close inter-relationship between the different rubber markets continues to hold. With reclaim following the market for new rubber, scrap can only join the procession. As in the case for reclaim, indicated rises in Spring production of automobiles and tires may, in turn, create an accelerated market for scrap rubber. Trade sources, however, are loathe to predict any striking advances within the foreseeable future. Some minor changes have been noted for scrap rubber within the past period. Current prices follow:

(Prices Delivered Akron)

Mixed tires	ton	13.50
Light colored carcass	lb.	.05½
No. 1 peelings	ton	48.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	24.00
Buffings	ton	18.00
Truck and Bus S.A.G.	ton	17.00
Passenger S.A.G.	ton	15.00
Natural Rubber Red Tubes	lb.	.11
Natural Rubber Black Tubes	lb.	.05½
Butyl Rubber Tubes	lb.	.02½

Tire Fabrics

According to "Textile Organon," production of tire cord and fabric (excluding cotton chafer fabric) in the third quarter of 1953 was 118,000,000 pounds, 5% below the figure for the second quarter of 1953, but 7% greater than the output in the July-September quarter of 1952.

Taking the synthetic fibers together, the third quarter output amounted to 114,000,000 pounds, or 97% of the total figure. Production of rayon tire fabric accounted for 90,000,000 pounds of this figure, while rayon tire cord amounted to 19,000,000 pounds. Output of nylon cord and fabric made up the balance of 5,000,000 pounds.

The rayon tire fabric figure was noticeably lower than the record established in the second quarter of this year, but the output of rayon tire cord was the same as in the preceding quarter. The steady growth in production of nylon tire cord and fabric continues.

Cotton tire cord and fabric remains a very minor factor, total output in the last quarter of 1953 having amounted to only 4,000,000 pounds. Output of cotton chafer fabric in the July-September period of 1953 was 13,000,000 pounds, compared with 16,000,000 pounds in the previous quarter and 11,000,000 pounds one year earlier.

Tire Yarn Output in 1953

According to figures compiled by American Enka, the industry's output of tire yarn in 1953 continued its unbroken rise to a new high level of 453,000,000 pounds, compared with 412,000,000 pounds produced in 1952 and 333,000,000 pounds in 1951. Industry capacity for the production of tire yarn at the end of 1953 was put at approximately 500,000,000 pounds.

Industrial Rayon advises that increases in tire rayon capacity at its plants have been virtually completed. According to this company, preliminary estimates indicate that from 92-93% of all tire cord produced in this country in 1953 was made of rayon. This compares with 58% in 1951 and 79% in 1952.

A process for making higher-strength yarn for tire cord developed by Industrial Rayon in 1953 is currently being introduced in the company's manufacturing activities. The company points out that continued improvement of rayon characteristics for the manufacture of tire cord is of first-line importance to the maintenance of rayon's economic advantage in this important market.

Marketwise, seasonal upturns predicted in the automotive and tire industries are expected to contribute to a parallel rise in tire fabrics. Inventories in the hands of consumers are said to be decreasing and as these supplies are replenished demand will increase, trade sources advise. Current prices follow:

(Prices f.o.b. Shipping Point)

Rayon Tire Cord		
1100	lb.	.76½
1650	lb.	.73½
2200	lb.	.73
Nylon Tire Cord		
210	lb.	2.00
840	lb.	2.00
Rayon Graded Fabric		
1100	lb.	.72
1650	lb.	.69½
2200	lb.	.68½
Cotton Chafers		
14.4 oz. (per square yard)	lb.	.71
9.25 oz. (per square yard)	lb.	.66½
11.65 oz. (per square yard)	lb.	.63
8.9 oz. (per square yard)	lb.	.68

Liquid Latex

Natural: According to Latex & Rubber, Inc., consumption of Hevea latex in the United States during the last quarter of 1953 has been what was expected and the total year's consumption reached a new peak of over 67,000 tons, an average of 5,600 tons a month. Likewise, the total world consumption of Hevea latex during 1953, appears to be reaching a new high. A world average of 9,400 tons per month was reported as having been consumed in the first nine months of 1953, compared with about 7,500 tons per month during the previous peak calendar year of 1952.

Estimates of U. S. consumption in the first half of 1954 still hover at 6,000 tons per month and above. Consumers in the U. S. used over 6,000 tons each in January and February, and since then additional foam producing capacity has come into production, all of which lends credence to the sanguine estimates. Current prices for "spot" or "nearby" deliveries range from 28.5 to 30c per pound.

There has been a strengthening of prices within the last sixty days, and differentials being offered by primary sellers are higher, for both long and short-term contracts, than the differentials being used during the third and fourth quarters of 1953. Should U. S. requirements for Hevea latex continue to increase beyond the estimated 6,000 tons monthly, differentials will rise in order that the additional concentrate can be provided.

Synthetic: It may safely be assumed that the estimates for the rise in Hevea latex consumption in the first half of 1954 will also apply to the synthetic latices. Price differentials here do not play as great a part as in dry rubber, and what with increases in foam production capacity and increasing uses in paints, etc., a good year is in prospect. U. S. prices for GR-S latices still range from 21½ to 26c per pound dry solids in tank cars, f.o.b. works, with a uniform freight charge of 1.1c per pound net wet weight.

Cotton

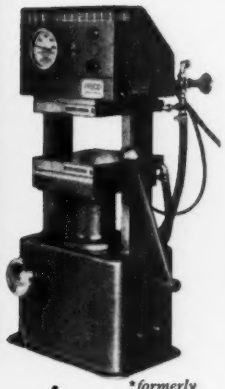
The price of middling uplands on the New York Cotton Exchange has moved in the extremely narrow range of 45 points since our last report (February 3), with high for the period being 35.25c reached on February 12, and low being 34.80c reached on February 3. The average price of middling uplands for the month of February was 35.00c based on 19 trading days. This compares with an average of 34.15c in January.

A bid for Congressional cotton bloc backing for flexible farm price support legislation was contained in a recent bill sponsored by Senator George D. Aiken (Rep., Vt.). The bill specifies that up to 4,000,000 bales of the government's price support inventories of cotton acquired in 1954 and prior years could be set aside and not counted when determinations are made next October on price support levels for 1955. This provision, it was believed, would have the effect of keeping 90% of parity price supports for cotton for another year, even though the avowed purpose of the bill was to substitute flexible for rigid price supports. Some stated they were not sure what effect the "set aside" feature would have, but observed that the introduction of the bill did not have an adverse effect on the market.

your best bet
in a small
moulding press

P·H·I*

COMPACT·FAST
DEPENDABLE



*formerly PRECO

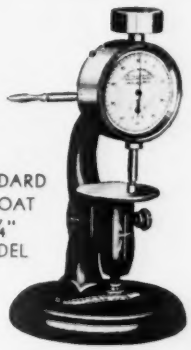
- Accurate pressure and temperature controls.
- Platens 8" x 8," 8¾" x 12," 12" x 12" & 12" x 18."
- Ram pressures to 60 tons.
- Special *Hot-Cold* laminating press.
- *Fast-action* 2 stage pump.
- Modifications to suit special needs.

PASADENA HYDRAULICS, INC.
277 N. Hill Ave., Pasadena 4, California

P·H·I
PRESS

RANDALL & STICKNEY

THICKNESS GAUGES FOR RUBBER



STANDARD THROAT 1¾" MODEL

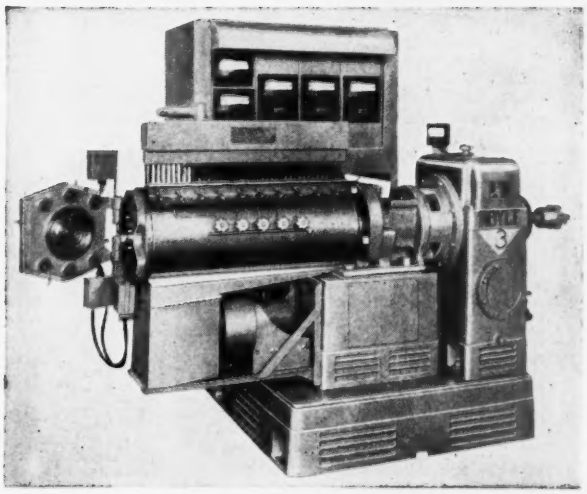
THROAT DEPTHS
1¾" to 26"
FOOT TENSIONS
supplied by Internal Spring or Direct Weights
FOOT DIAMETERS
⅛" to 1¼"
ROLLS
Table and Roll or two Rolls
RANGE
½" or 1", also 1 CM Metric

26" DEEP THROAT MODEL

SEND FOR CIRCULARS to Dept. A.

FRANK E. RANDALL CO., Inc.
248 Ash St., Waltham 54, Mass., U.S.A.

FASTEST HEATING FASTEST COOLING



Here are some of the time-tested, money-saving reasons more and more plants are standardizing with Royle Spirod* Extruders for processes requiring maximum flexibility in controlled temperatures — constantly maintained and accurately zoned:

- **Extra heavy walled cast steel cylinders that will not warp. No joints to leak when pressures are high or crevices to collect burned compound that would cause contamination.**
- **Heavy duty large diameter heating elements, that can be used with 440 volts without step-down transformers, provide radiant heat to cylinders and heads.**
- **Any heating element may be removed and replaced without disturbing other elements or wiring.**
- **A cooling system with ten times the capacity of conventional designs can be modulated through its entire temperature range without drastic changes. Ample cooling for all compounds at maximum speeds.**

No. 3 Royle Spirod Extruder. Completely insulated and equipped for evaporative cooling.

*Patent Applied For

JOHN ROYLE & SONS

ROYLE
PATERSON N. J.

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN 1880

London, England
James Day (Machinery) Ltd.
REgent 2430

Home Office
V. M. Hovey J. W. VanRiper
SHerwood 2-8262

Akron, Ohio
J. C. Clinefelter
SWandale 4-5020

Los Angeles, Cal.
H. M. Royal, Inc.
LOgan 3261

PATERSON 3, NEW JERSEY

STATISTICS

of interest to the rubber industry

Natural Rubber in the United States

(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1925	400,423	388,500	14,827	51,215
1926	417,643	366,200	17,671	72,510
1927	431,246	373,000	27,775	99,282
1928	439,731	437,000	32,159	65,454
1929	565,087	467,400	36,485	118,609
1930	487,628	376,000	30,205	201,000
1931	501,788	355,200	25,609	322,000
1932	414,668	336,700	20,937	379,000
1933	418,902	412,300	20,576	365,000
1934	463,018	462,500	23,856	355,000
1935	467,146	495,508	11,391	303,000
1936	488,145	575,000	12,582	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422 714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,227	627,332	6,673	141,541
1949	660,792	574,522	6,253	106,619
1950	802,249	720,268	8,644	89,215
1951	733,048	454,015	2,603	76,569
1952	805,997	453,846	3,024	95,260
1953	661,203	553,434	8,335	112,192
1953:				
Jan.	63,767	47,766	528	97,730
Feb.	48,455	45,231	981	94,151
Mar.	56,786	50,707	605	98,627
Apr.	60,578	49,375	692	108,892
May	56,280	46,889	521	113,532
June	61,423	45,224	409	112,959
July	54,661	43,929	596	118,825
Aug.	44,156	43,732	567	119,332
Sept.	58,625	45,225	790	121,618
Oct.	46,729	46,744	657	114,191
Nov.	49,743	43,251	1,107	113,899
Dec.	.....	42,361	882	112,192

Source: U. S. Department of Commerce.

U. S. Imports of Natural Rubber

Year	Dry: Long Tons	Dry: Declared Value	Latex: Long Tons	Latex: Declared Value	Total Imports
1936	467,064	152,072,496	19,852	6,659,899	486,916
1937	574,600	237,307,041	23,185	10,213,670	597,785
1938	397,640	125,373,864	11,944	4,168,127	409,584
1939	469,946	167,586,780	27,437	10,467,552	497,383
1940	781,202	303,308,823	33,789	14,593,466	814,991
1941	989,498	401,976,317	34,797	15,965,627	1,024,245
1942	266,276	112,537,426	10,646	5,630,667	276,922
1943	50,358	31,369,198	1,890	1,312,202	52,248
1944	103,847	73,908,549	3,091	2,092,211	106,938
1945	134,408	95,814,102	4,773	3,115,853	139,181
1946	376,502	228,796,110	8,421	5,843,085	384,923
1947	691,087	306,951,814	17,542	9,787,722	708,629
1948	702,293	290,849,177	32,745	18,288,223	735,038
1949	630,808	225,343,624	29,743	14,968,650	660,551
1950	747,109	416,222,598	54,401	41,764,486	801,510
1951	677,874	727,343,348	54,963	80,178,309	732,837
1952	756,987	578,179,519	48,228	40,563,116	805,215
1953:					
Jan.	57,516	31,296,490	6,250	4,168,234	63,766
Feb.	42,562	24,336,087	6,338	4,480,115	48,900
Mar.	50,115	28,724,364	6,671	4,733,320	56,786
Apr.	54,272	29,729,394	6,302	4,206,828	60,574
May	50,452	25,495,937	5,674	3,609,808	56,126
June	55,020	26,430,694	6,407	3,786,254	61,427
July	47,971	22,599,799	6,691	3,845,099	54,662
Aug.	37,507	17,712,672	6,648	3,970,600	44,155
Sept.	52,498	23,968,865	6,127	3,405,762	58,625
Oct.	40,638	18,037,134	6,537	3,844,351	47,175
Nov.	.....	.....	.....	.....	.....
Dec.	.....	.....	.....	.....	.....

Source: Bureau of the Census, U. S. Department of Commerce.

World Production of Natural Rubber

(Including Latex)

(Long Tons)

Year	Malaya	Indonesia	Ceylon	Viet Nam & Cambodia	Latin America	Rest of World*	Total*
1942	155,000*	200,000*	101,500	76,177	35,794	71,476	640,000
1943	75,000*	100,000*	105,500	70,370	40,900	72,507	465,000
1944	25,000*	50,000*	98,500	60,419	49,946	77,002	360,000
1945	8,600*	10,000*	97,500	12,000*	47,125	73,570	250,000
1946	403,719	175,000*	94,000	19,975	39,678*	105,080	837,500
1947	646,362	277,951	89,000	38,128	34,928*	172,792	1,260,000
1948	698,189	432,349	95,000	43,935	29,158*	226,056	1,525,000
1949	671,503	432,996	89,500	43,010	27,318*	225,907	1,490,000
1950	694,090	696,472	113,500	48,482	26,902*	279,541	1,860,000
1951	605,346	814,406	105,000	52,316	29,777*	277,716	1,885,000
1952	584,828	745,652	96,500	63,134	35,475*	260,111	1,785,000
1953:							
Jan.	54,987	67,031	8,000	7,172	4,675*	23,345	165,000
Feb.	42,693	44,841	6,500	1,953	3,079*	21,542	120,000
Mar.	43,916	54,893	6,500	2,797	4,048*	22,471	135,000
Apr.	43,094	54,109	7,000	3,928	3,465*	20,144	132,500
May	45,636	60,911	7,500	5,365	2,650*	18,545	140,000
June	44,352	58,165	7,500	5,791	1,523*	13,945	132,500
July	50,743	65,211	6,500	6,537	1,951	22,076	152,500
Aug.	51,141	58,710	9,500	6,555	2,206	17,118	147,500
Sept.	47,452	58,929	8,500	6,197	2,623	19,669	142,500
Oct.	50,033	53,934	7,500	....	....	19,796	142,500
Nov.	....	....	....	....	....	....	.....
Dec.	....	....	....	....	....	....	.....

Source: International Rubber Study Group. * Estimated.

World Consumption of Natural and Synthetic Rubber

(Including Latex)

(Long Tons)

Year	United States	United Kingdom	Canada	Europe*	Rest of World*	Total*
1942	394,442	97,056	42,144	180,000	162,856	877,500
1943	488,525	66,730	32,896	150,000	156,104	907,500
1944	710,783	86,977	34,310	132,500	160,690	1,125,000
1945	799,009	91,047	41,836	87,500	108,164	1,127,500
1946	1,039,296	126,770	39,196	145,000	125,804	1,477,500
1947	1,122,327	156,399	61,452	242,500	153,548	1,735,000
1948	1,069,404	196,286	62,121	390,000	184,379	1,902,500
1949	988,903	186,622	56,362	446,500	207,388	1,887,500
1950	1,258,557	222,425	68,695	448,500	287,055	2,285,000
1951	1,214,298	238,101	70,809	476,500	314,191	2,312,500
1952	1,261,413	202,179	67,099	550,000	254,651	2,335,000
1953:						
Jan.	120,576	18,346	6,053	41,500	25,447	212,500
Feb.	114,119	15,778	6,679	48,250	25,071	210,000
Mar.	128,610	15,994	6,668	48,500	28,832	227,500
Apr.	126,596	18,776	6,490	42,500	25,510	220,000
May	119,123	16,646	6,281	39,750	28,719	210,000
June	119,975	16,093	6,660	38,750	27,090	210,000
July	105,228	17,190	5,506	37,500	24,744	190,000
Aug.	102,973	14,550	4,694	32,000	24,556	177,500
Sept.	103,877	18,209	5,904	39,750	33,096	200,000
Oct.	104,754	21,839	6,096	39,000	25,154	197,500
Nov.	.....	.....	.....	.....	.....	.....
Dec.	.....	.....	.....	.....	.....	.....

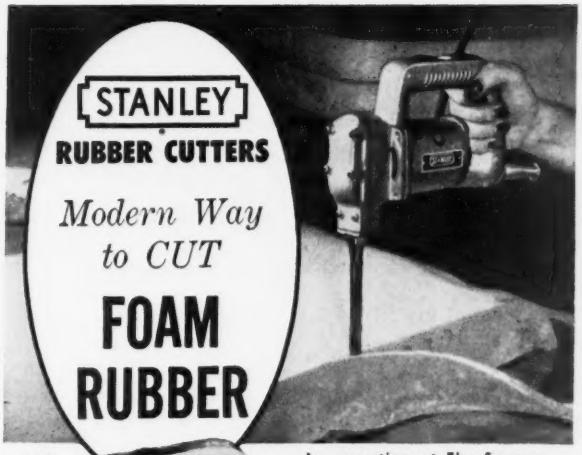
Source: International Rubber Study Group. * Estimated.

U. S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

Year	Balata: Tons	Balata: Value	Jelutong: Tons	Jelutong: Value	Gutta-Percha & Other Guttas: Tons	Gutta-Percha & Other Guttas: Value
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1950	2,117	1,589,885	1,789	1,515,162	541	745,418
1951	2,452	1,973,271	1,669	2,608,359	383	430,539
1952	988	762,994	1,636	2,094,983	282	385,890
1953:						
Jan.	....	.....	77	155,276	6	10,474
Feb.	105	67,265	120	182,792	21	32,473
Mar.	84	74,828	97	83,918	22	44,791
Apr.	309	196,917	87	76,143	7	7,761
May	53	27,463	552	64,822	5	3,388
June	106	56,457	90	93,063	16	16,565
July	160	79,349	66	59,003	40	48,868
Aug.	124	75,627	96	103,480	7	13,743
Sept.	133	59,783	77	105,542	21	41,681
Oct.	50	23,033	161	110,166	10	18,363
Nov.	....	.....	....	.....	....	.....
Dec.	....	.....	....	.....	....	.....

Source: U. S. Department of Commerce.



STANLEY
RUBBER CUTTERS
Modern Way to CUT
FOAM RUBBER

NOS. 994-996

In operation at The Sponge Rubber Co., Inc., Shelton, Conn.

No Pinch • No Waste

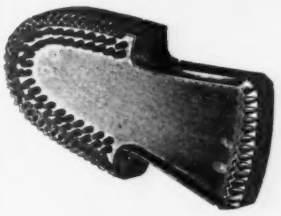
Cuts Even • Cuts Quicker

Operator can follow template or any marked pattern. Cuts straight lines, curves or angles at up to 30 ft. a minute. For further information write, 426 Myrtle St., New Britain, Conn.

STANLEY *Electric Tools*

HARDWARE • TOOLS • STEEL STRAPPING • STEEL

It's Progressive...



FOR FINER
CUTTING DIES of all kinds
MALLET DIES
CLICKER DIES
PERFORATING DIES
I. D. and O. D. DIES
PUNCH PRESS
TRIMMING DIES
PUNCH PRESS
PINCHING DIES
RENCO CUTTING PADS and BLOCKS

Also Manufacturers of
Precision Automatic Screw Machine Products, Inserts, etc.

Makers of Western RMH Cutting Dies.

PROGRESSIVE SERVICE COMPANY

Main Office and Factory
2747 Locust St.
ST. LOUIS, MO.
Tel.: NEWSTEAD 4300

Branch Office and Factory
82 S. Cameron St.
HARRISBURG, PA.
Tel.: 2-8146

Manufacturers of CANARY LINERS

Mildew-proofing *and* Flame-proofing Cotton Fabrics as per Government Specifications. *Write or Wire for Samples and Quotations.*

EXPORT AGENT
Binney & Smith, International, Inc.,
380 Madison Ave., New York 17, N. Y.

CANADIAN AGENT
Binney & Smith, Limited
33 Edward St., Toronto 3, Ontario, Canada

J. J. WHITE Products Co.
7000 UNION AVENUE
CLEVELAND 5, OHIO

Synthetic Rubber in the United States

(All Quantities in Long Tons)

New Supply

Year	GR-S	Neoprene	Butyl	N-Type	Total
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,599	35,215	54,046	11,072	410,932
1950	578,887	50,067	60,915	12,037	501,906
1951	704,529	58,907	76,475	15,333	855,244
1952	654,854	65,745	81,630	16,228	818,447
1953:					
Jan.	57,112	6,619	5,697	1,570	70,998
Feb.	54,482	6,619	5,738	1,371	68,210
Mar.	67,685	6,220	7,573	1,472	82,950
Apr.	68,052	7,076	7,464	1,654	84,248
May	71,116	6,665	6,827	1,752	86,360
June	65,762	6,800	7,043	1,541	81,146
July	66,070	6,030	6,657	1,594	80,351
Aug.	53,411	6,610	7,202	1,646	69,177
Sept.	45,969	6,943	6,771	2,062	61,745
Oct.	42,147	6,784	6,736	2,300	57,967
Nov.	43,020	7,137	6,036	1,777	57,970
Dec.	45,661	6,990	6,057	1,459	60,167

Consumption

1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	414,381
1950	416,230	43,781	66,348	11,930	538,289
1951	626,444	48,887	70,500	13,066	758,897
1952	666,420	55,522	71,229	13,866	807,037
1953:					
Jan.	58,789	5,516	7,097	1,408	73,080
Feb.	55,480	5,122	7,016	1,270	68,888
Mar.	62,691	5,850	7,913	1,449	77,903
Apr.	61,881	5,908	8,057	1,375	77,171
May	58,165	5,542	7,325	1,262	72,234
June	57,262	5,677	7,431	1,381	71,751
July	48,916	4,581	6,616	1,186	61,382
Aug.	47,018	5,357	5,551	1,315	59,372
Sept.	46,267	5,407	5,587	1,391	58,652
Oct.	46,150	5,443	5,506	1,416	58,515
Nov.	41,604	4,911	4,919	1,236	52,670
Dec.	39,942	4,797	4,783	1,233	50,755

Exports

1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874
1949	1,401	3,330	178	1,574	6,483
1950	900	4,826	31	1,895	7,652
1951	483	6,825	216	1,725	9,249
1952	9,467	9,813	126	2,695	22,101
1953:					
Jan.	298	961	43	165	1,467
Feb.	458	566	114	124	1,262
Mar.	548	930	0	213	1,691
Apr.	414	818	47	210	1,489
May	943	1,127	3	201	2,274
June	769	741	2	257	1,769
July	765	905	4	236	2,021
Aug.	820	895	3	257	1,840
Sept.	702	1,065	0	456	2,223
Oct.	455	915	4	303	1,677
Nov.	729	1,155	11	409	2,304
Dec.	592	1,035	8	356	1,991

Stocks

1945	170,571	9,703	18,378	4,802	203,454
1946	81,483	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042
1950	36,942	5,733	7,243	2,840	52,758
1951	105,271	8,379	12,481	3,821	129,912
1952	83,861	8,535	22,716	3,875	118,987
1953:					
Jan.	83,921	9,001	18,378	4,802	203,454
Feb.	81,550	9,078	19,560	3,911	114,099
Mar.	84,013	8,738	19,581	3,757	116,089
Apr.	89,839	9,364	19,144	3,694	122,041
May	100,873	8,986	18,376	3,874	132,109
June	112,770	9,073	18,141	3,805	143,789
July	127,278	10,036	18,280	3,892	159,443
Aug.	134,930	10,008	20,269	3,939	169,153
Sept.	132,453	9,671	21,280	4,221	167,625
Oct.	129,655	10,138	22,435	4,496	166,724
Nov.	127,454	11,067	23,401	4,591	166,523
Dec.	135,262	11,634	24,797	4,455	176,148

Source: U. S. Department of Commerce.

Natural and Synthetic Rubber Latex in the United States

(All Quantities in Long Tons)

New Supply

Year	Natural	GR-S	Neoprene	N-Type	Total Synthetic	Grand Total
1942	9,595	.....	210	.....	210	9,805
1943	1,890	194	1,512	.....	1,706	3,596
1944	3,090	6,580	4,683	.....	11,263	14,353
1945	4,768	15,176	7,077	.....	22,253	27,021
1946	8,012	24,810	13,595	.....	38,405	46,417
1947	17,675	22,474	6,089	.....	28,563	46,238
1948	32,630	21,494	5,022	.....	26,516	59,146
1949	29,974	21,357	3,651	.....	25,008	54,982
1950	54,401	31,339	5,725	.....	37,064	91,465
1951	54,963	32,972	6,866	2,948	42,786	97,749
1952	48,228	42,273	7,598	4,164	54,035	102,263
1953:						
Jan.	6,250	4,290	895	451	5,636	11,886
Feb.	6,339	4,064	819	437	5,320	11,659
Mar.	6,671	4,238	728	407	5,373	12,044
Apr.	6,302	4,472	879	429	5,780	12,082
May	5,548	4,784	721	439	5,944	11,492
June	6,403	4,331	739	425	5,495	11,898
July	6,691	3,997	571	466	5,034	11,725
Aug.	6,649	3,149	753	633	4,535	11,184
Sept.	6,127	3,518	778	582	4,878	11,005
Oct.	6,537	3,654	753	733	5,140	11,677
Nov.	4,826	3,715	754	352	4,821	9,647
Dec.	.....	3,900	636	490	5,026	....

Consumption[1]

1942	9,392	.....	200	....	200	9,592
1943	9,578	150	1,400	....	1,550	11,128
1944	6,085	6,000	4,400	....	10,400	16,485
1945	3,886	14,500	6,800	....	21,300	25,186
1946	5,714	23,500	13,000	....	36,500	42,214
1947	13,909	22,500	6,500	....	29,000	42,909
1948	28,489	21,500	5,250	....	26,750	55,239
1949	36,117	21,500	3,750	....	25,250	61,367
1950	56,138	31,000	5,500	..	36,500	92,638
1951	46,750	31,031	6,279	2,628	39,938	86,688
1952	53,567	40,562	7,368	3,093	51,023	104,590
1953:						
Jan.	6,097	4,219	739	344	5,302	11,399
Feb.	5,642	3,993	703	302	4,998	10,640
Mar.	6,317	4,502	739	359	5,600	11,917
Apr.	5,937	4,172	764	341	5,277	11,214
May	5,395	4,008	643	310	4,961	10,356
June	5,654	3,950	704	358	5,012	10,666
July	5,100	3,750	554	298	4,602	9,702
Aug.	5,203	3,576	670	343	4,641	9,832
Sept.	5,504	3,599	678	166	4,443	9,947
Oct.	5,897	3,719	660	312	4,563	10,460
Nov.	5,234	3,510	553	244	4,307	9,541
Dec.	5,494	3,533	534	277	4,344	9,838

Stocks at End of Period

1942	13,450	....	....	....	....	13,450
1943	5,638	....	....	....	....	5,638
1944	2,443	....	....	....	....	2,443
1945	3,121	....	....	....	....	3,121
1946	4,865	....	....	....	....	4,865
1947	5,033	....	....	....	....	5,033
1948	11,235	....	....	....	....	11,235
1949	5,063	....	....	....	....	5,063
1950	4,927	....	....	....	....	4,927
1951	4,752	3,727	1,245	532	5,504	10,256
1952	6,201	5,040	1,019	902	6,961	13,162
1953:						
Jan.	6,340	4,940	1,143	913	6,996	13,336
Feb.	6,905	5,041	1,167	971	7,179	14,084
Mar.	6,738	4,804	1,075	880	6,759	13,497
Apr.	7,428	4,815	1,233	833	6,881	14,309
May	7,648	5,254	1,163	715	7,132	14,780
June	8,094	5,744	1,069	593	7,406	15,500
July	9,256	5,861	1,162	514	7,537	16,793
Aug.	10,273	5,081	1,127	617	6,946	17,992
Sept.	11,370	4,794	1,122	638	6,554	17,924
Oct.	11,126	4,990	1,133	737	6,860	17,986
Nov.	10,834	4,533	1,064	743	6,340	17,174
Dec.	13,595	4,881	1,072	768	6,721	20,316

Source: U. S. Department of Commerce.
Note: (1) GR-S and Neoprene consumption estimated through 1950.

THE SMACO GASKET SPLICER

SPLICER
VULCANIZER
EMBOSSER
MOLDER

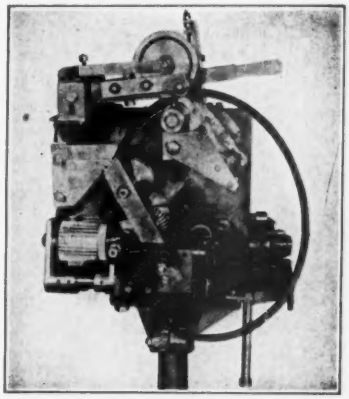
Features

- SPEED
- NO BREAKDOWNS
- HEAT CONTROLS IN BOTH BRONZE PLATENS
- ONE OPERATOR — FROM 1 TO 8 UNITS
- LONG LIFE HEATERS AND THERMOSTATS

Ask ABOUT OUR HAND RUBBER CUTTER

For Further Information . . . . Write to
SIVON MANUFACTURING CO.
PAINESVILLE, OHIO

Utility Crimper Type Flipper
for
Truck and Large Balloon Tires



UTILITY MANUFACTURING COMPANY
Cudahy, Wisconsin

Cable Address: UTILITY-MILWAUKEE
Long Distance Phone Call
MILWAUKEE—SHERIDAN 4-7020

Trade Mark

HEVEATEX
CORPORATION
78 GOODYEAR AVENUE
MELROSE 76, MASS.

BRANCHES: CHICAGO, ILL. AKRON, O. DETROIT, MICH. LOS ANGELES, CAL.

Natural and Synthetic
Latex and Latex Compounds
for all purposes

Rubber Industry Employment Earnings and Hours

All Rubber Products

	1952				1953			
Mo.	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
Jan.	210.4	$74.03	40.9	$1.81	219.2	$78.09	41.1	$1.90
Feb.	208.2	73.31	40.5	1.81	219.2	79.30	41.3	1.92
Mar.	208.0	72.54	40.3	1.80	220.5	80.29	41.6	1.93
Apr.	205.6	71.28	39.6	1.80	220.5	79.32	41.1	1.93
May	205.7	73.31	40.5	1.81	220.2	78.18	40.3	1.94
June	206.6	75.26	40.9	1.84	220.3	78.55	40.7	1.93
July	194.7	72.07	39.6	1.82	213.2	78.98	40.5	1.95
Aug.	203.1	73.49	40.6	1.81	214.4	76.81	39.8	1.93
Sept.	208.3	75.21	41.1	1.83	214.8	74.11	38.8	1.91
Oct.	212.5	75.53	41.5	1.82	209.7	74.87	39.2	1.91
Nov.	216.6	76.86	41.1	1.87	203.2	....	....	....
Dec.	219.2	79.19	41.9	1.89	....	....	....	....

Tires and Tubes

Jan.	91.3	87.12	40.9	2.13	91.5	89.24	40.2	2.22
Feb.	91.1	85.67	40.6	2.11	91.2	91.80	40.8	2.25
Mar.	90.8	83.58	39.8	2.10	91.6	93.83	41.7	2.25
Apr.	91.4	81.74	39.3	2.08	92.2	91.58	40.7	2.25
May	91.5	84.84	40.4	2.10	92.7	91.30	40.4	2.26
June	91.8	87.95	41.1	2.14	....	89.20	40.0	2.23
July	90.0	84.38	39.8	2.12	90.1	90.45	40.2	2.25
Aug.	88.6	85.46	40.5	2.11	89.6	87.58	39.1	2.24
Sept.	90.0	86.28	40.7	2.12	89.3	81.11	36.7	2.21
Oct.	90.2	85.88	40.7	2.11	85.7	82.06	37.3	2.20
Nov.	90.8	87.23	40.2	2.17	....	....	....	....
Dec.	91.8	90.42	41.1	2.20	....	....	....	....

Rubber Footwear

Jan.	24.1	60.15	40.1	1.50	24.5	64.96	40.1	1.62
Feb.	23.4	60.50	39.8	1.52	24.2	67.57	41.2	1.64
Mar.	22.9	61.51	40.2	1.53	24.2	67.57	41.2	1.64
Apr.	20.9	59.34	39.3	1.51	23.8	67.82	41.1	1.65
May	22.3	60.65	39.9	1.52	23.3	60.31	37.0	1.63
June	22.5	61.26	40.3	1.52	23.5	68.06	41.0	1.66
July	18.0	58.95	39.3	1.50	22.5	68.64	41.1	1.67
Aug.	22.7	61.81	40.4	1.53	23.6	65.53	40.2	1.63
Sept.	23.5	62.99	40.9	1.54	24.0	64.08	39.8	1.61
Oct.	24.3	63.71	41.1	1.55	24.3	62.95	39.1	1.61
Nov.	24.7	68.30	41.9	1.63	....	....	....	....
Dec.	28.2	66.49	41.3	1.61	....	....	....	....

All Other Rubber Products

Jan.	95.0	65.51	41.2	1.59	103.2	71.74	42.2	1.70
Feb.	93.7	64.55	40.6	1.59	103.8	71.06	41.8	1.70
Mar.	94.3	64.87	40.8	1.59	104.7	71.72	41.7	1.72
Apr.	93.3	63.84	39.9	1.60	104.5	71.21	41.4	1.72
May	91.9	65.28	40.8	1.60	104.2	70.93	41.0	1.73
June	92.3	65.85	40.9	1.61	104.4	71.28	41.2	....
July	86.7	62.25	39.4	1.58	100.6	70.64	40.6	....
Aug.	91.8	65.28	40.8	1.60	101.2	70.30	40.4	1.74
Sept.	94.8	67.65	41.5	1.63	101.5	70.30	40.4	1.74
Oct.	98.0	68.95	42.3	1.63	99.7	71.40	40.8	1.75
Nov.	101.1	69.81	41.8	1.67	....	....	....	....
Dec.	102.2	72.33	42.8	1.69	....	....	....	....

Source: U. S. Department of Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who work during, or received pay for, any part of the pay period ending nearest the 15th of the month. These employment series have been adjusted to first quarter 1951 benchmark levels indicated by data from government social insurance programs. Hours and earnings data pertain only to production and related workers.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	32.58	36.09	33.37	31.89	45.04	42.96	33.24	34.15
Feb.	33.91	33.63	33.41	32.79	(a)	41.64	33.76	35.00
Mar.	35.89	35.04	33.44	32.65	46.06	41.70	34.10	....
Apr.	35.89	38.10	33.84	33.23	46.06	41.79	33.85	....
May	36.51	38.57	33.73	33.64	46.06	39.68	34.30	....
June	37.83	38.12	33.56	34.61	46.06	41.31	34.11	....
July	38.03	34.89	32.99	38.11	41.21	40.37	34.20	....
Aug.	34.83	32.23	32.06	38.93	35.93	40.42	33.82	....
Sept.	32.21	31.92	30.94	41.62	36.20	39.75	33.69	....
Oct.	32.39	32.01	30.32	40.66	38.13	37.52	33.53	....
Nov.	34.50	32.15	30.52	43.11	42.70	35.59	33.60	....
Dec.	36.74	32.90	31.08	43.37	43.32	33.76	33.52	....
Average for Year	35.11	34.64	32.44	37.05	42.43	39.71	33.81	....

Note: The Government established a ceiling price of 45.76c for spot cotton on March 3, 1951. (a) Trading suspended during February.

Production Index for the Rubber Industry

(1947-1949 = 100)

(Based on man-hours)

	1951	1952	1953		1951	1952	1953
Jan.	122	116	132	July	106	92	114
Feb.	125	119	140	Aug.	112	109	122
Mar.	125	120	143	Sept.	122	118	122
Apr.	126	114	140	Oct.	117	131	128
May	123	111	137	Nov.	113	129	....
June	127	115	131	Dec.	106	123	....

Sales by the Rubber Industry

(in Millions of Dollars*)

	1951	1952	1953		1951	1952	1953
Jan.	398	408	424	July	407	377	448
Feb.	398	402	435	Aug.	413	388	409
Mar.	455	400	473	Sept.	400	427	416
Apr.	411	407	444	Oct.	420	423	385
May	413	402	422	Nov.	430	383	385
June	414	409	436	Dec.	365	418	....

Rubber Manufacturers' Inventories

(in Millions of Dollars*)

	1951	1952	1953		1951	1952	1953
Jan.	576	809	866	July	655	890	925
Feb.	578	842	868	Aug.	677	877	897
Mar.	577	857	880	Sept.	700	871	908
Apr.	576	850	874	Oct.	754	866	981
May	599	855	888	Nov.	755	850	842
June	633	851	914	Dec.	805	877	....

Source: U. S. Department of Commerce.
Notes: * Adjusted for seasonal variation.

No. 1 R.S.S.—Annual Average Prices

(New York Market—Cents per Pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1912	140	108	121.60	1933	9 7/8	2 7/8	5.96
1913	113	59	82.04	1934	15 7/8	8 3/4	12.92
1914	93	56	65.33	1935	13 3/4	10 1/2	12.37
1915	79	58 1/2	65.85	1936	23	13 1/2	16.41
1916	102	55	72.50	1937	26 7/8	14	19.39
1917	90	52	72.23	1938	17 7/8	10 3/4	14.64
1918	70	40	60.15	1939	24	14 1/2	17.57
1919	57	38 1/2	48.70	1940	24	18 1/4	20.10
1920	56 1/2	16	36.30	1941	24 7/8	19 3/8	22.40
1921	21 3/4	11 1/2	16.36	1942	22 1/2	22 1/2	22.50
1922	28 3/8	13 5/8	17.50	1943	22 1/2	22 1/2	22.50
1923	37 1/8	24 3/4	29.45	1944	22 1/2	22 1/2	22.50
1924	40 1/8	17 5/8	26.20	1945	22 1/2	22 1/2	22.50
1925	121	34 3/8	72.46	1946	22 1/2	22 1/2	22.50
1926	88 1/2	36 3/4	48.50	1947	25	14	20.00
1927	41 3/4	33	37.72	1948	25	18	21.99
1928	41 3/4	17	22.48	1949	19 3/4	15 7/8	17.57
1929	26 7/8	15 1/2	20.55	1950	86	18	41.10
1930	16 1/2	7 1/2	11.98	1951	76	52	(a)
1931	8 5/8	4 1/4	6.17	1952*	53	26 1/2	29.15
1932	4 3/4	2 1/2	3.49	1953	31 7/8	19 3/8	24.21

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947. (a) Free trading suspended March 31, 1951. GSA selling price ranged between 52 and 66c during balance of year. * Free trading was resumed on July 1, 1952; figures represent only July through December, 1952.

No. 1 R.S.S.—Monthly Average Prices

(New York Market—Cents per pound)

	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	22.50 (b)	21.83	19.23	18.33	71.21	....	29.40	20.22
Feb.	25.75 (b)	20.42	18.49	19.40	73.61	....	27.57	19.98
Mar.	25.75 (b)	20.33	19.08	19.86	72.05	....	26.59	....
Apr.	25.75 (b)	22.87	18.53	23.51	..	....	24.66	....
May	21.04	23.39	17.92	28.07	....	....	25.52	....
June	16.29	22.80	16.36	30.92	....	....	24.42	....
July	15.48	24.24	16.45	39.10	....	30.52	23.64	....
Aug.	15.23	23.63	16.60	51.63	....	29.36	23.36	....
Sept.	16.55	22.81	17.58	55.98	....	27.42	23.06	....
Oct.	20.38	22.13	16.31	62.19	....	27.06	20.82	....
Nov.	23.57	20.52	16.70	73.05	....	29.25	20.58	....
Dec.	21.45	18.86	17.53	71.20	....	31.26	20.92	....
Average for Year	20.00	21.99	17.57	41.10	(a)	29.15	24.21	....

Notes: (a) Free trading suspended March 31, 1951, and resumed on July 1, 1952. (b) Price fixed by Government.

PHOTOGRAPH BY RICHARD BEATTIE

What we still don't know about cancer

—and one of the reasons why

IN THE PAST FEW YEARS, our knowledge of the nature of cancer, and how to treat it, has grown encouragingly. Patients, who would have been considered hopeless cases even five years ago, today are being completely cured. And even those who apply for treatment too late can usually live longer—and less painfully—because of modern palliative treatment.

All the same, there have been defeats as well as victories. We do not know—to take a single example—why so many more men are now dying from cancer of the lung. In 1933—just twenty years ago—lung cancer killed 2,252 men; in 1953, some 18,500. That's a great increase—which even our expanded population, and other known factors, can't possibly account for in full.

Well, why haven't we found more of the answers to cancer?

Not only because cancer is an immensely complex problem: difficult to diagnose, and difficult to treat; challenging to the best research minds.

All that is true enough. But there is another reason: *we do not* have enough money.

Last year your gifts to the American Cancer Society were more generous than ever before. But they were not enough.

You gave the Society almost twenty millions to fight a disease that—at present death rates—will kill twenty-three million living Americans.

Less than one dollar for each American destined to die from cancer. Much more is needed for research, for education, for clinics. Won't you please do *your* part . . . now?

American Cancer Society

Cancer
Man's cruelest
enemy
strike back
Give

GENTLEMEN:
☐ Please send me free information on cancer.
☐ Enclosed is my contribution of $.....
to the cancer crusade.

Name.....
Address.....
City.....State.....

Simply address the envelope:
CANCER c/o Postmaster, Name of Your Town

Automotive Pneumatic Casings

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1943 (total)	6,128	18,547	225	24,900	20,423	1,883
Passenger Car.	82	10,606	71	10,759	7,620	1,132
Truck and Bus	6,046	7,941	154	14,141	12,803	751
1944 (total)	6,654	26,439	263	33,356	33,446	2,013
Passenger Car.	208	18,330	130	18,668	18,819	1,218
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car.	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49,148	1,787	77,781	81,314	10,698
Passenger Car.	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949 (total)	31,584	43,466	1,467	76,517	76,369	10,638
Passenger Car.	28,129	36,440	509	65,077	65,140	8,904
Truck and Bus	3,456	7,026	958	11,440	11,228	1,734
1950 (total)	41,349	56,808	1,430	99,587	92,754	3,794
Passenger Car	36,678	47,103	642	84,423	78,598	3,050
Truck and Bus	4,671	9,705	788	15,164	14,156	743
1951 (total)	32,153	44,612	1,677	78,442	83,405	8,765
Passenger Car	26,729	34,226	723	61,678	65,546	6,973
Truck and Bus	5,424	10,386	954	16,764	17,859	1,791
1952 (total)	29,484	54,342	1,520	85,346	90,411	14,110
Passenger Car.	24,106	45,458	741	70,305	74,341	11,251
Truck and Bus	5,378	8,884	779	15,041	16,070	2,859
1953 (total)	37,949	55,124	1,543	94,617	96,150	15,720
Passenger Car.	33,106	45,798	809	79,713	81,455	13,044
Truck and Bus	4,843	9,326	734	14,904	14,696	2,676
1953:						
Jan. (total)	3,004	4,794	84	7,882	8,238	14,118
Passenger Car	2,563	3,916	33	6,512	6,824	11,288
Truck and Bus	440	878	51	1,369	1,414	2,830
Feb. (total)	3,263	3,895	85	7,243	8,236	15,295
Passenger Car.	2,764	3,161	28	5,953	6,847	12,310
Truck and Bus	499	735	57	1,290	1,389	2,985
Mar. (total)	3,570	4,598	87	8,256	9,407	16,456
Passenger Car.	3,039	3,793	41	6,874	7,918	13,364
Truck and Bus	531	805	46	1,382	1,488	3,092
Apr. (total)	3,798	5,001	115	8,913	9,262	16,872
Passenger Car.	3,290	4,265	45	7,599	7,833	13,666
Truck and Bus	508	736	70	1,314	1,429	3,207
May (total)	3,200	5,604	139	8,942	8,987	16,973
Passenger Car	2,822	4,816	75	7,712	7,655	13,656
Truck and Bus	378	788	64	1,230	1,331	3,318
June (total)	3,537	5,601	142	9,279	8,572	16,259
Passenger Car.	3,216	4,819	75	8,111	7,311	12,852
Truck and Bus	320	782	66	1,168	1,261	3,406
July (total)	3,616	5,793	146	9,555	8,173	14,883
Passenger Car.	3,181	4,953	99	8,232	7,119	11,736
Truck and Bus	435	840	48	1,323	1,061	3,147
Aug. (total)	3,130	5,523	145	8,798	7,416	13,550
Passenger Car.	2,757	4,649	87	7,493	6,406	10,684
Truck and Bus	372	874	58	1,304	1,010	2,866
Sept. (total)	2,837	4,437	149	7,424	7,148	13,287
Passenger Car.	2,503	3,691	84	6,278	6,082	10,494
Truck and Bus	334	747	65	1,146	1,067	2,793
Oct. (total)	3,155	4,246	172	7,573	7,664	13,446
Passenger Car.	2,832	3,212	90	6,135	6,529	10,941
Truck and Bus	323	1,034	82	1,438	1,135	2,505
Nov. (total)	2,221	2,730	135	5,085	6,565	14,852
Passenger Car.	1,875	2,185	75	4,134	5,531	12,284
Truck and Bus	346	545	60	951	1,034	2,568
Dec. (total)	2,620	2,903	143	5,667	6,481	15,720
Passenger Car.	2,263	2,340	76	4,679	5,406	13,044
Truck and Bus	357	563	67	988	1,075	2,676

Source: The Rubber Manufacturers Association, Inc.

Rim Production

	1949	1950	1951	1952	1953
Passenger Car	27,715,344	35,096,404	29,145,367	24,936,844	31,318,461
Truck & Bus	4,238,174	6,625,129	6,877,419	5,752,674	5,228,321
Agricultural	2,695,430	2,853,483	3,019,581	2,073,116	1,943,487
Earth Mover	9,895	15,602	28,026	31,791	24,685
Total	34,658,843	44,590,618	39,070,393	32,794,425	38,514,954

	1953					1954
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Passenger Car	2,425,096	2,151,010	2,286,669	1,886,944	2,154,376	2,156,823
Truck & Bus	399,013	342,106	304,713	322,822	445,950	447,581
Agricultural	121,468	128,262	94,063	72,135	109,852	89,324
Earth Mover	1,348	1,793	1,594	1,234	1,253	1,670
Total	2,946,925	2,623,171	2,687,039	2,283,135	2,711,431	2,695,398

Source: The Tire & Rim Association, Inc.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1934	2,177,919	575,192	2,753,111	1944	0	124,819	124,819
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1940	3,692,328	721,637	4,413,965	1950	6,665,836	1,332,263	7,998,099
1941	3,744,500	875,381	4,619,681	1951	5,337,729	1,420,432	6,758,161
1942	220,814	133,083	353,897	1952	4,320,794	1,212,790	5,533,584
1943	0	4,501	4,501	1953	6,121,787	1,202,196	7,323,983
1952:							
Jan.	273,639	100,993	374,632	July	168,327	43,231	211,558
Feb.	334,058	100,533	434,591	Aug.	218,577	52,056	270,633
Mar.	373,237	109,167	482,404	Sept.	438,397	112,375	550,772
Apr.	416,155	112,833	528,988	Oct.	471,808	132,064	603,872
May	398,286	105,208	503,494	Nov.	405,111	114,106	519,217
June	408,700	109,526	518,226	Dec.	418,983	116,214	535,197
1953:							
Jan.	453,319	111,599	564,918	July	599,134	105,622	704,756
Feb.	486,071	96,740	582,811	Aug.	513,457	101,478	614,935
Mar.	566,320	134,129	700,449	Sept.	475,289	98,051	573,340
Apr.	596,633	126,754	723,387	Oct.	528,088	91,955	620,043
May	549,677	93,443	643,120	Nov.	378,406	73,710	452,116
June	587,549	74,063	661,612	Dec.	387,844	94,652	482,496

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
Year	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1942	6,895	7,213	159	14,267	12,685	6,206
1943	6,350	12,474	189	19,014	15,014	2,626
1944	6,460	20,569	196	27,224	27,488	2,813
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950	41,240	42,671	811	84,723	80,179	..
1951	32,151	32,284	1,071	65,507	67,249	10,694
1952	29,451	32,985	1,014	63,449	65,073	12,036
1953	37,972	36,110	882	74,965	74,514	11,564
1953:						
Jan.	3,012	4,477	49	7,538	6,130	10,169
Feb.	3,261	3,052	51	6,364	6,428	10,308
Mar.	3,571	2,941	44	6,555	7,470	11,242
Apr.	3,797	2,896	67	6,760	7,544	12,155
May	3,200	3,315	71	6,586	6,940	12,592
June	3,539	3,298	71	6,907	7,035	12,811
July	3,614	3,600	73	7,288	6,395	12,097
Aug.	3,139	3,315	75	6,529	5,679	10,226
Sept.	2,841	2,768	111	5,720	5,656	11,288
Oct.	3,156	2,696	107	5,960	5,752	10,904
Nov.	2,222	1,708	76	4,006	4,738	11,611
Dec.	2,620	1,917	87	4,625	4,533	11,564

Source: The Rubber Manufacturers Association, Inc.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1946	1947	1948	1949	1950	1951	1952	1953
Jan.	51,746	57,057	61,308	63,125	66,981	80,670	86,863	89,634
Feb.	47,654	50,551	56,487	57,980	53,274	72,864	82,043	86,458
Mar.	56,703	59,947	68,171	73,282	78,780	86,962	87,065	98,158
Apr.	62,111	64,140	72,183	75,318	80,350	87,573	98,653	102,044
May	66,800	70,865	77,186	81,665	89,035	100,266	101,137	105,867
June	63,247	71,329	78,044	83,374	90,174	96,364	99,305	105,918
July	60,076	73,441	81,428	83,129	91,677	100,567	105,307	114,703
Aug.	66,729	72,089	80,351	84,707	94,507	101,453	102,954	112,960
Sept.	62,268	71,384	76,159	80,832	86,725	91,891	100,095	109,124
Oct.	66,637	73,277	75,164	79,327	89,067	100,209	103,689	.....
Nov.	61,345	64,158	72,560	76,346	82,688	88,581	91,326	.....
Dec.	61,101	67,506	72,162	75,628	81,032	84,551	95,817	.....
Total	735,417	795,015	871,270	913,713	994,290	1,091,951	1,154,254	.....

Source: U. S. Bureau of Mines.

Now Available—

Second Edition of

LATEX IN INDUSTRY

By ROYCE J. NOBLE, Ph. D., F. I. R. I.

The first edition of this valuable book was published in 1936 and has been out of print for many years. Accordingly, the publication of a completely revised and enlarged edition is welcome news to the thousands of users of rubber latex who have been seeking an up-to-the-minute text book.

The author has kept posted on every phase of the latex industry since the first edition and has incorporated in the new edition complete details on all current uses of this versatile material. The book is replete with illustrations, charts, formulas and full descriptions of the various processes in use today.

920 Pages • 6 x 9 Inches • 25 Chapters

Bibliography • Author Index • Subject Index

PRICE: $15.00 Postpaid in U. S.
$16.00 Postpaid In All Other Countries

Published by

RUBBER AGE

250 West 57th St. New York 19, N. Y.

Various Compounding Materials Consumed by the Rubber Industry

Material	1947	1948	1949	1950	1951	1952	1953
Antimony, Primary:							
Short tons	39	41	55	103[c]	19[c]	66	.....
% of total	.002	.003	.005	.007	.001	.005	.....
Asphalt:[a]							
Short tons	32,113	19,967	18,050	26,819	21,414	33,288	.....
% of total	0.7	0.4	0.3	0.3	0.3	0.4	.....
Barite (Barytes):							
Short tons	17,000	18,000	14,000	19,000	15,000	14,000	.....
% of total	3.1	2.85	2.53	3.31	2.13	2.0	.....
Carbon Black:							
Short tons	471,790	435,282	383,565	515,184	530,614	537,273	.....
% of total	94.3	95.5	93.3	92.9	93.9	93.1	.....
Clay, Kaolin:							
Short tons	166,201	176,965	197,341	263,306	231,331	240,982	.....
% of total	11.5	11.3	13.1	15.0	12.7	13.2	.....
Clay, Fire & Stoneware:							
Short tons	17,970	15,480	27,148	9,500	.....	9,322	.....
% of total	0.2	0.2	0.3	0.1	.....	0.1	.....
Lime:							
Short tons	589	1,154	715	908	1,126	2,000	.....
% of total	0.01	0.02	.0002	.0002	(d)	(d)	.....
Litharge:							
Short tons	2,205	2,835	1,398	3,047	2,641	2,109	.....
% of total	1.3	1.8	1.2	1.7	1.7	1.5	.....
Lithopone:							
Short tons	3,085	4,192	3,245	4,092	3,295	1,523	.....
% of total	1.9	3.0	4.1	3.9	3.2	2.5	.....
Mica, Ground:							
Short tons	3,900	4,372	3,856	5,776	6,551	5,126	.....
% of total	6.0	7.0	7.0	8.0	9.0	7.0	.....
Sulfur:							
Short tons	72,800	70,560	59,360	75,000	75,000	75,000	.....
% of total	1.8	1.7	1.5	1.3	1.6	1.6	.....
Talc:[b]							
Short tons	71,840	66,226	53,400	75,900	70,970	64,476	.....
% of total	13.9	13.0	12.0	12.0	11.2	10.9	.....
Zinc Oxide:							
Short tons	82,248	82,895	58,496	82,944	71,507	72,774	.....
% of total	51.2	54.9	52.5	51.6	48.4	51.2	.....

Source: U. S. Bureau of Mines.
Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes prophyllite and ground soapstone. (c) Does not include precipitated antimony sulfide as in previous years. (d) Negligible.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption: Tons	Consumption: % to Crude [a]	Exports	Stocks On Hand at End of Period
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007 [b]	254,820	64.6	30,405	42,532
1943	304,058 [c]	291,082	59.6	15,678	46,201
1944	260,631 [d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	226,679	22.5	10,637	28,263
1950	314,008	303,733	24.1	11,740	35,708
1951	366,700	346,121	28.6	14,722	45,082
1952	274,981	280,002	22.2	11,180	30,664
1953	298,191	282,496	21.1	11,521	32,899
1953:					
Jan.	27,258	24,696	20.5	866	31,244
Feb.	24,583	24,098	21.1	950	30,631
Mar.	28,224	27,386	21.3	908	29,931
Apr.	29,032	26,483	20.9	1,261	31,263
May	27,142	25,213	21.2	964	31,763
June	26,554	24,637	20.5	962	32,791
July	23,292	23,414	22.3	807	31,506
Aug.	22,607	22,666	22.0	638	30,318
Sept.	23,469	22,409	21.6	894	30,147
Oct.	23,649	21,944	20.8	823	30,692
Nov.	21,323	19,638	20.5	1,086	31,226
Dec.	21,318	19,304	20.7	955	32,899

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (a) Includes natural and synthetic rubber. (b) Includes 893 tons of imports. (c) Includes 67 tons of imports. (d) Includes 21 tons of imports.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton: Tire Cord Not Woven	Cotton: Cord Fabric Woven	Cotton: Chafer and All Other Tire Fabrics	Cotton: Total	Rayon and Nylon[b]: Tire Cord not Woven	Rayon and Nylon[b]: Tire Cord and Other Tire Fabrics	Rayon and Nylon[b]: Total
1950:							
Jan.-Mar.	3,939	19,210	12,948	36,097	12,469	60,981	73,450
Apr.-June	11,077	29,498	14,071	54,646	11,510	59,966	71,476
July-Sept.	10,529	39,792	15,101	65,152	13,161	61,614	74,775
Oct.-Dec.	13,314	37,759	14,405	65,578	12,942	63,399	76,341
Total	38,859	126,259	56,525	221,473	50,082	245,960	296,476
1951:							
Jan.-Mar.	11,497	38,269	16,737	66,503	11,878	65,512	77,390
Apr.-June	12,608	42,491	17,055	72,154	11,979	61,957	73,936
July-Sept.	16,744	44,340	17,433	78,517	12,091	67,982	80,073
Oct.-Dec.	14,237	43,820	13,899	71,956	*a*	83,354	83,354
Total	55,116	168,920	65,124	289,160	35,948	278,805	314,753
1952:							
Jan.-Mar.	11,226	36,378	12,971	60,575	14,434	72,249	86,683
Apr.-June	4,661	24,612	10,742	40,015	16,874	81,249	98,123
July-Sept.	335	9,257	9,460	19,052	18,128	80,355	98,483
Oct.-Dec.	*c*	4,728*a*	11,580	16,308	19,436	81,171	100,607
Total	16,222	74,975	44,753	135,950	68,872	315,024	383,896
1953:							
Jan.-Mar.	*c*	4,378*a*	15,477	19,855	20,487	91,742	112,229
Apr.-June	*c*	5,713*a*	15,880	21,593	18,906	95,711	114,617
July-Sept.	*c*	3,562*a*	13,193	16,755	18,597	89,821	108,418
Oct.-Dec.	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....	.....	.....

Source: Bureau of the Census, U. S. Department of Commerce.
Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord not woven. (d) Included with chafer and all other tire fabrics.

Consumption of Vinyl Resins

(In Thousands of Pounds)

Year	Sheeting and Film [a]	Textile and Paper Coating Resins	Molding and Extrusion Materials	All Other
1950	227,149	46,044	113,889	21,868
1951	161,547	43,688	134,890	23,934
1952	154,902	42,298	140,872	31,793
1953:				
Jan.	14,830	4,284	15,424	3,076
Feb.	16,516	4,145	13,847	2,919
Mar.	17,575	4,950	14,906	3,683
Apr.	16,574	4,934	15,332	2,800
May	14,766	4,126	13,509	3,084
June	.....	.....	.....	.....
July	.....	.....	.....	.....
Aug.	.....	.....	.....	.....
Sept.	.....	.....	.....	.....
Oct.	.....	.....	.....	.....
Nov.	.....	.....	.....	.....
Dec.	.....	.....	.....	.....

Source: U. S. Tariff Commission.
Note: (a) Includes weight of fillers, plasticizers, extenders and safety-glass sheeting. Beginning January, 1951, statistics are listed on a resin content basis.

Gaps in your technical library?

Looking for one, convenient, source for *all* books dealing with rubber?

For complete service on *any* book* on rubber, place your order with the

Book Department

RUBBER AGE

250 West 57th St., New York 19, N. Y.

** a listing of available books on rubber will be furnished on request.*

CLASSIFIED WANT ADS

RATES:

All Classifications (except Positions Wanted):
10c per word in light face type—Minimum, $3.00
15c per word in bold face type—Minimum, $3.00

Positions Wanted:
$1.00 for 30 words or less; extra words, 5c each.

When Box Number is used, add 5 words to word count.

Heading on separate line, $1.00 in light face; $1.20 in bold face.

Advertisements in borders: $15.00 per column inch; maximum, 85 words per inch.

All Classified Advertising must be paid in advance except for advertisers on contract. Send check with copy.

Replies to keyed advertisements will be forwarded to advertiser without charge.

Address all replies to Box Numbers care of RUBBER AGE, 250 West 57th Street, New York 19, N. Y.

Copy for April, 1954, issue, must be received by Thursday, April 1st

POSITIONS WANTED

LATEX CHEMIST—Experienced in laboratory development, sales service and production of natural and synthetic latex as applied in the textile field. Can relocate and will accept foreign employment. College graduate. Address Box 811-P, RUBBER AGE.

Experienced in small business management, sales and broad technical work. Specialized in large and small plant product development, production problems, etc., primarily rubber field. Age 39. Prefer warm climate, foreign considered. Address Box 820-P, RUBBER AGE.

SUPERINTENDENT or MANAGER: 15 years experience slab soling, mechanical rubber production; also plastic garden hose extruding. Know complete rubber shop routine. Prefer clean, progressive shop. Address Box 861-P, RUBBER AGE.

PLANT MANAGER or Superintendent—wishes to locate with a progressive rubber company. Twenty-five years experience in the manufacturing of rubber heels, soles, soling slabs, toplifting material, open cell sponge and closed cell sponge rubber. Capable of assuming full charge or supervisory position. Address Box 874-P, RUBBER AGE.

TAPE CHEMIST—Extensive experience in all phases of manufacture and formulation of pressure-sensitive tapes. Interested in executive laboratory position in tape or related field. Address Box 872-P, RUBBER AGE.

RUBBER CHEMIST—at present employed in small rubber manufacturing company—12 years experience control and development of mechanical goods. Wishes responsible position with progressive concern. Domestic or foreign location considered. Address Box 879-P, RUBBER AGE.

PLANT MANAGER—with 25 years experience of manufacturing (tires, tubes, camelback, slab soling, tile and mechanicals) desires position where his knowledge of production, compounding, processing, practical engineering and trouble shooting will be useful. Two years experience with Government in NPA, Rubber Div., in important position. Address Box 883-P, RUBBER AGE.

SUPERINTENDENT-CHEMIST: Wants better opportunity for advancement. Broad practical and technical experience manufacturing mechanical and sponge rubber products. Capable as Production Manager or Technical Director. Educated as chemical engineer. Trained with large organization as development engineer for products and processes. Address Box 888-P, RUBBER AGE.

CHEMICAL ENGINEER—Thirteen years experience in adhesives, coatings, slab soling, flocking; covering development, production, management, sales, technical service. Excellent record of achievement. Age 34, married. Desires to relocate. Address Box 882-P, RUBBER AGE.

LATEX FOAM RUBBER CHEMIST—desires to relocate, preferably coastal location. Will accept position with latex concern other than foam for research or development. Have textile coating and rubber background, complete knowledge of machinery. Desires permanent connection, if possible, with aggressive company. Will accept foreign relocation. Address Box 887-P, RUBBER AGE.

RUBBER CHEMIST and Compounder—long experience in all footwear manufacturing operations. Molded and extruded goods, latex toys. Familiar with reclaiming. Address Box 889-P, RUBBER AGE.

PLANT MANAGER and Engineer—wishes to relocate with progressive firm, 12 years experience plant layout, designing and operating latex foam rubber plants, manufacturing pillows, mattresses, slab, strips and novelty items. Presently employed. Address Box 893-P, RUBBER AGE.

CHEMIST — CHEMICAL ENGINEERS
"Positions with the better firms"

An active, confidential service!
Interview at your convenience!

"Many Junior Positions"
Call, write, or wire:—GLADYS HUNTING (Consultant)

EMPLOYMENT COUNCIL, INC.
7 W. Madison St., Chicago 2, Ill., FI 6-2107

HELP WANTED

CHEMICAL ENGINEER—openings available for young men who really want to grow with an expanding organization. Development work on very interesting products. Mechanical goods, all types of synthetic rubber and plastics. We want men who have had a few years well rounded experience, who have imagination and ambition. State all particulars. Enclose a picture if possible. Address Box 867-W, RUBBER AGE.

CHEMICAL ENGINEER

Small aggressive rubber plant needs a chemical engineer experienced in the development, compounding, factory processing and application of tank linings, roll coverings and molded goods.

This company has an unusual bonus and pension plan, pleasant surroundings and working conditions. Therefore, if you are a wide-awake person and know you can qualify, please give full details as to education, experience, background and salary requirement along with a small photograph, if possible, in first letter.

Address Box 880-W
RUBBER AGE

CHEMIST—with one to three years dry rubber compounding experience to work in Eastern laboratory with possible eventual transfer to technical sales. In responding, please include record of scholastic training, industrial experience, salary requirements, references and recent snapshot photograph of yourself. Address Box 876-W, RUBBER AGE.

Prominent National Packing Manufacturer has an opening in his modern research center for an experienced rubber compounder to devote full time to developing and compounding from synthetic and natural rubber products to meet specifications for industrial applications. Finest equipment and facilities in Northern New Jersey location. Our employees have been told of this advertisement. Apply Box 884-W, RUBBER AGE.

Help Wanted continued on page 999

NATURAL and SYNTHETIC
Rubber Testing
and Formulations

RESEARCH LABORATORIES
FOSTER D. SNELL INC.
29 WEST 15-ST. NEW YORK 11, N.Y. — WA 4-8800
CHEMISTS · ENGINEERS

In All Their
Ramifications.
Trouble-Shooting.

RUBBER MACHINERY

AVAILABLE FOR IMMEDIATE DELIVERY

The machinery listed below was manufactured for a foreign customer who has been unable to take delivery because of political conditions in his country. The machinery is brand-new, is packed for export, and is in storage. We have been authorized to offer it for immediate sale, subject to prior bid. For full details of any items in which you may be interested, apply to

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN.

Rubber Machinery

2 Size 11 Banbury Mixers and Drives
1 12″ Plasticator and Drive
2 24″ x 66″ 3-Roll Calenders and Drives
2 26″ x 84″ Mills and Drives
10 22″ x 60″ Mills and Drives
5 Strip Cutters for 60″ or 84″ Mills
2 Rubber Bale Cutters

Speed Reducers

1 DR-33 Double Reduction Unit, 12.54/1 Ratio
1 DR-24 Double Reduction Unit, 12.5/1 Ratio
1 DR-20 Double Reduction Unit, 12.43/1 Ratio
1 SR-2614 Single Reduction Unit, 9.83/1 Ratio
1 SR-2011 Single Reduction Unit, 10/1 Ratio

Chilled Iron Rolls

3 22″ x 66″ Rolls
2 22″ x 50″ Rolls
2 20″ x 50″ Rolls
16 18″ x 48″ Rolls
4 16″ x 44″ Rolls
4 16″ x 42″ Rolls
4 16″ x 30″ Rolls
10 14″ x 36″ Rolls
4 12″ x 30″ Rolls
2 9¾″ x 25″ Rolls
6 9-7/16″ x 25″ Rolls
24 9⅛″ x 25″ Rolls
6 9″ x 25″ Rolls
1 9″ x 25″ Nihard Roll

FB-918

Unique Colloidal Whiting
Economical Rubber
Re-inforcer

HAKUENKA

Special attention to Export Trade
SHIRAISHI KOGYO KAISHA, LTD.
Kitahama, Osaka, Japan

THE DAILY GUIDE

This is indispensable to buyers of Rubber

THE TRADE NEWS SERVICE
Established 1915
24 Stone St. **New York 4, N. Y.**

featuring
MARKET REPORTS • RUBBER IMPORTS • STATISTICS
Write for Free Trial Service

Can't find the office copy of

RUBBER AGE?

Why not enter your own subscription now — today — and have a copy just for yourself. Rates are:

$5.00 for 1 year in the U.S.
$5.50 in Canada
$6.00 - Foreign

Please enter my subscription to RUBBER AGE for one year starting with the next issue.

☐ Check enclosed ☐ Bill me

Name _____
Title _____
Company _____
Street _____
City and State _____

Please check whether address is ☐ Company or ☐ Home.

HELP WANTED—Continued

CONSULTING ENGINEER—South American tire factory wishes to enter into relation with a rubber engineer with experience as a plant manager and willing to act as consulting engineer. Address correspondence to Maros Buying Service Co., Inc., 15 Whitehall St., New York 4, N. Y.

CHEMIST—medium size plant located Eastern Pennsylvania. Prefer practical man to theorist. Must have heavy experience and complete knowledge of Banbury compounding. Steady position, good pay and oportunity to advance. If you are afraid of hard work, please don't apply. State age, experience and salary requirement in first letter. Address Box 885-W, RUBBER AGE.

RUBBER COMPOUNDERS

Large rubber company in Rocky Mountain region needs: Compounder with extensive practical experience in tires. Capable of developing new formulas and production follow up on mixing, extruding and calendering. Compounders with minimum experience of 2 years in broad compounding principles on various elastomers for belts, hose, tires, and molded rubber goods. Specific experience in any one field satisfactory. Address Box 875-W, RUBBER AGE.

RUBBER TECHNOLOGIST

An unusual opportunity for graduate chemist or engineer with a minimum of 10 years of research and development experience in rubber compounding to work on challenging research programs in the rubber field. A working knowledge of rubber processing equipment and rubber chemistry is required. The position entails supervision and responsibility for the operation of a complete and modern rubber laboratory. Excellent employee benefits: competitive salary scale, retirement plan, liberal vacations, hospitalization, credit union, and group life insurance, plus generous financial assistance for graduate study. Send resume to:

J. A. Metzger,
Armour Research Foundation
Technology Center
Chicago 16, Ill.

PLASTIC TILE CHEMIST

Large manufacturing plant in New England seeks Chemist experienced in production of rubber, asphalt and plastic floor tile and other molded industrial rubber products. Write outline showing education and business experience, particularly in above fields. Specify salary expected. Address Box 891-W, RUBBER AGE

RUBBER MOLDED GOODS SALESMAN for Greater New York City area, New Jersey and Philadelphia to sell standard and custom molded goods. Local, young aggressive salesman preferred. New England plant. State qualifications with resume. Replies confidential. This advertisement is known to our staff. Address Box 892-W, RUBBER AGE.

CHEMIST—experienced in sponge rubber compounding. Midwest location. In reply please give complete resume including age, experience, education and salary desired. All replies confidential. Address Box 894-W, RUBBER AGE.

BUSINESS OPPORTUNITIES

WANT CHEMICAL ENGINEER or experienced rubber plant man to invest and help organize new rubber products manufacturing plant in Midwestern city. Please give full particulars. All replies confidential. Address Box 873-B, RUBBER AGE.

RUBBER CEMENT FACTORY for sale, near Boston. Land, buildings, all equipment. Priced cheap to settle estate. Address Box 886-B, RUBBER AGE.

FOR SALE—40,000 lbs. GR-I (Butyl) below schedule. CHEMSOL, INC., 74 Dod Court, Elizabeth, N. J. Phone: Elizabeth 3-1369.

CHEMICAL ENGINEER with 27 years of compounding, production and engineering experience is available in consulting capacity: rubber, latex, Butyl, reclaim problems. Address Box 890-B, RUBBER AGE.

SALESMEN or DISTRIBUTORS calling on rubber manufacturers. To represent import company for antioxidant—anticracking—antiaging product. All territories open. Address Box 895-B, RUBBER AGE.

CUSTOM MIXING, GRINDING and DISPERSION. Production time available on Rotary Cutters, Colloid Mills and explosion-proof Churns with attached filtering mediums. At your service—the technical know-how and completely equipped control laboratory. ADHESIVES & COATING SPECIALTIES, INC., Bldg. #22, 410 Frelinghuysen Ave., Newark 5, N. J.

FOR SALE

Rubber and Phenolic compounding plant in operation. Approximately 50,000 square feet floor space, one floor, 21 acres land, railroad siding facilities. Equipped with No. 9 Banbury, two 60" mills, 40" mill, 32" mill, blenders, grinders, phenol and formaldehyde tanks, laboratory, etc. Address Box 877-B, RUBBER AGE

MIXING
To Your Specification
K. B. C. INDUSTRIES, INC. NEW HAVEN, CONN.
881 State St. Tel: State 7-5662
Otto J. Lang, General Manager

Custom Mixing
RUBBER-PLASTICS
We do milling and compounding of all types—black or color—master batches
All mixing done under careful supervision and laboratory control.
Phone: Butler 9-0400

Pequanoc Rubber Co.
MANUFACTURERS OF RECLAIMED RUBBER
MAIN SALES OFFICE and FACTORY, BUTLER, N. J.

CUSTOM RUBBER MILLING
BLACK • WHITE • COLORS
Preparation of master batches and complete compounds of every type to meet your specifications and requirements.
ABC RUBBER CO.
1451 South Sangamon St. Chicago 8, Illinois
Telephone: TAylor 9-0644

BLACK
Master Batching
Mixing of all kinds
BESTREAD PRODUCTS CO. STOUGHTON, MASS.

Light Colored
CUSTOM MIXING
A. K. Rubber Products Co.,
Walworth, Wisconsin Phone: 5333
U. S. Route 14—60 miles northwest of Chicago

NATIONAL SHERARDIZING & MACHINE CO.
AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS
858 Windsor St., Hartford, Conn.
Representatives: Akron New York

SINCE 1880 RUBBER & PLASTIC
Rand
REG. U. S. PAT. OFF.
"They Last Longer"
REG. U. S. PAT. OFF.
DRESS SHIELDS
DRESS SHIELD LININGS
BABY PANTS
BABY BIBS & APRONS
SANITARY WEAR
RUBBERIZED SHEETING
RUBBER APRONS
STOCKINET SHEETS
RUBBER SHEETS
RAINCAPES & COATS
RUBBER SPECIALTIES
DOLL PANTS, CAPES, ETC.
RUBBER DAM & BANDAGES — SHEET GUM
RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

GRANULATED CORK
PROCESSED TO SPECIFICATION
MARYLAND CORK COMPANY, INC.
1528 Munsey Bldg. Baltimore 2, Md.

FINELY PULVERIZED, BRILLIANT
COLORS
FOR RUBBER-VINYLS

Western Representative: FRED L. BROOKE CO., 3340 N. Halsted St., Chicago 13, Ill.
Ohio Representative: PALMER SUPPLIES CO., 8905 Lake Ave., Cleveland; 800 Broadway, Cincinnati
Pacific Coast: ERWIN GERHARD, 625 Market St., San Francisco 5, Calif.

BROOKLYN COLOR WORKS INC.,
MORGAN & NORMAN AVES., BROOKLYN 22, N.Y.

"CAROLITE" permanently flexible lead-free LAQUERS

for application on

RUBBER, FABRICS, LEATHER, PAPER

Contain no plasticizers that will be lost by volatilization or extraction.

Resistant to gasoline, alcohols, acids, alkalies; and vegetable and animal oils and greases.

Century Products Company
Detroit 38, Mich.

STEEL CALENDER STOCK SHELLS

ALL STEEL, ALL WELDED CONSTRUCTION, with forged steel hubs for 1¼", 1½" and 2" square bars.

4", 5", 6", 8", 10", 12", 15", 20" and 24" diameters. Any length.

Also Special Trucks (Leaf Type) Racks, Tables and Jigs Used in manufacturing rubber and plastic products.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

Do you receive enough copies of
RUBBER AGE
to be seen by your key men while
the magazine is still current?

Directory of CONSULTANTS

R. R. OLIN LABORATORIES
Rubber Technologist—Development and research in Natural Rubber, Synthetic Rubber and Plastics. Also chemicals and compounding materials used with these materials.
P.O. Box 372 RA, Akron 9, Ohio

SOUTH FLORIDA TEST SERVICE
(Established 1931)
Corrosion, weathering and sunlight tests. Four locations in Southern Florida for inland, salt atmospheric, tidewater and total immersion exposure tests.
4201 N. W. 7th St., Miami, Florida

PHILIP TUCKER GIDLEY
Consulting Technologist—Research, product development, formulas, factory plans, engineering, chemical and physical testing.
Fairhaven, Massachusetts

HALE AND KULLGREN, INC.
Specialists in Process and Plants for Rubber and Plastics
A Complete Engineering Service; including: Economic Surveys; Process Design; installation; Contracting and Operation.
613 E. Tallmadge Ave., Akron 10, Ohio

WILLIAMS TOXICOLOGY LABORATORIES, INC.
Toxicological Tests of Industrial Materials and Consumer Goods
Consulting Services in Industrial Hygiene
SUITE 1518, 1420 WALNUT STREET, PHILADELPHIA 2, PA.
Telephone: PEnnypacker 5-5516-17

THE JAMES F. MUMPER CO.
ENGINEERS
Plant design, buildings, services. Process & equipment development. Modernization—cost reduction. Surveys & Reports.
313 Everett Bldg. Phone: JEfferson 5939 — Akron 8, Ohio JEfferson 4543

RMP ANTIMONY
• ATTRACTIVE
• NON-DETERIORATING
for RED RUBBER
RARE METAL PRODUCTS CO.
ATGLEN, PA.

101
Engineered Application of Heat in Continuous Materials Handling Systems
INDUSTRIAL OVENS, INC.
13825 TRISKETT ROAD, CLEVELAND 11, OHIO

FLEXO JOINTS

THE STANDARD FOR SAFETY

• Proved in years of efficient service, FLEXO JOINTS offer the flexibility of hose — the strength of pipe — the ideal steam connection for presses, tire molds, etc.
Four styles, for standard pipe sizes ¼" to 3".
• Write for information and prices.

FLEXO SUPPLY CO., INC., 4662 Page Blvd., St. Louis 13, Mo.
S. A. ARMSTRONG, LTD.
In Canada: 1400 O'Connor Dr., Toronto 13, Ont.

EQUIPMENT WANTED

WANTED: Rubber mills, calenders, mixers, Banbury mixers, extruders, grinders, cutters, hydraulic presses, injection molding machines. Consolidated Products Co. Inc., 70 Bloomfield St., Hoboken, N. J.

WANTED: Rubber machinery including Banbury mixers, heavy duty mixers, calenders, rubber rolls and mixers, extruders, grinders and cutters, hydraulic equipment, rotary and vacuum shelf dryers, injection molding machines. Will consider now operating or shut down plant. P. O. Box 1351, Church Street Station, New York 8, N. Y.

WANTED—Banbury mixer bodies and parts, any size. Write INTERSTATE WELDING SERVICE, Metropolitan Bldg., Akron 8, Ohio.

WANTED

Rubber Mill—16" x 48" or 18" x 50", complete with drive and motor.
Also one 8" x 24" or 10" x 24" 3-roll calender.
Also one No. 5 tuber, 8".

Blando Rubber Corp.,
96-05 Liberty Ave., Ozone Park, L. I., N. Y.

WANTED: Extruder, No. 2 Royle or equivalent. Might be able to use slightly larger machine. Address Box 881-E, RUBBER AGE.

EQUIPMENT FOR SALE

PRESS—48" x 66" platens, six 3" openings, four 12" rams. First class condition. Address Box 856-S, RUBBER AGE.

MODEL C WILLS Sub-Zero Tumbler—48 inch drum, complete with speed ranger motor unit, silent chain drive. Good condition. Real buy at $590.00. Address Box 878-S, RUBBER AGE.

FOR SALE: 15" x 40" Farrel mill, complete with drive, motor and brake. NEW ENGLAND ENGINEERING CO., P. O. Box 465, Derby, Conn.

FOR SALE—Complete #9 Banbury body fully rebuilt; 1 pair #27 Banbury steel rotors, rebuilt; #27 Banbury side jackets, rebuilt; #27 Banbury bull gear, pinion and pinion shaft. INTERSTATE WELDING SERVICE, Offices, Metropolitan Building, Akron 8, Ohio.

FOR SALE—one 22" x 60" vertical Birmingham 4-roll calender; one Day mixer, 2 screw agitator tip type, 200 gals., not jacketed; one 24" rubber mill; one 150 hp Birmingham drive with G E motor; one 72" Sheridan embossing press. LOWELL TANK & MACHINERY CO., 58 Union St., Boston 8, Mass. Phone: CApitol 7-9844.

FOR SALE—three rubber mills, 10" x 20", 12" x 30", 16" x 40" M.D.; one Farrel 24" x 66" 3-roll vertical calender; twenty-five 32" x 32" steel platens. Also vulcanizers, Banbury mixers, hydraulic presses, cutters, etc. CHEMICAL & PROCESS MACHINERY CORP., 146 Grand St., New York 13, N. Y.

HYDRAULIC PRESSES

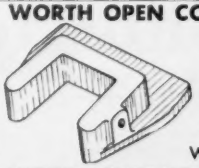
1—Erie Belt Press, 4242 Tons, 2—8" openings, 18'-0" x 52" Steel Steam Platens, 6 rams—30" dia. x 16" stroke.
1—Birdsboro, 2000 Tons, down-acting ram 34" dia. x 14" stroke, 48" DLO, 42" x 42" bed area.
1—Clearing, 500/1500 Tons, completely self-contained with controls for manual or automatic operation, suitable for compression and injection molding.
1—Farrel, 393 Tons, 48" x 48" steam platens, 2—15" openings, 4 rams—10" dia. x 24" stroke, approx. 15" per opening.
1—Watson-Stillman, 100 Tons, down-acting ram 11¼" x 9½" x 6" stroke, 22" x 20" bed, 24" DLO, self-contained, 15HP MD Vickers Pump. Unit PRACTICALLY NEW.
1—Watson-Stillman, 100 Tons, 11¾" x 12" platens, 22½" DLO, ram—8" dia. x 15" stroke, complete with 3 HP MD Pump.
1—HPM, 100 Tons, 18" x 18" Platen Area, ram 8" dia. x 18" stroke, 30" DLO, Steel Cylinder—4000 PSI.
2—Burroughs, 75 Tons, down-acting, 17½" x 17" electric-heated platens, 13½" DLO, ram—8" dia. x 10" stroke, complete with 7½ HP MD Oilgear Pump.
1—HPM, 35 Tons, down-acting ram 6" dia. x 6" stroke, 15" DLO, 12" x 6" bed area, self-contained.
1—Industo Laboratory Press, 12 Tons, Hand Operated, 8" x 8" electrically heated platens. NEW.
INJECTION MOLDING MACHINES: 1—Plasticor vertical 2 oz., electrically heated, hand operated; 1 HPM horizontal model 54, 2 oz., 22 ton clamp, 12 ton injection, manual control, oil heated.
1—Banbury No. 3A mixer, with spare rebuilt body, no motor.
1—Thropp 22" x 20" x 60" mixing mill, 150 HP motor and drive.
1—Thropp 14" x 42", vertical 2-roll sheeting calender, 15 HP motor drive, variable speed.
Also: Plastics & Rubber Extruders, Mills, Mixers, Grinders, Injection Molding Machines; Pumps, Valves, Platens, etc.

JOHNSON MACHINERY COMPANY
683-R Frelinghuysen Avenue — Newark 5, New Jersey
Bigelow 8-2500
What have you for sale? — **What are you looking for?**

"Equipment for Sale" continued on next Page

softeners and plasticizers
for rubber from the pine tree
ROSIN OIL • PINE TAR
BURGUNDY PITCH
GALEX a non-oxidizing RESIN
Send for "Pine Tree Products" Booklet
NATIONAL ROSIN OIL PRODUCTS, Inc.
Americas Bldg. Rockefeller Center 1270 Ave. of the Americas New York 20
PIONEERS OF THE INDUSTRY

THE ALUMINUM FLAKE COMPANY
AKRON 14, OHIO
Manufacturers of
ALUMINUM FLAKE
A colloidal hydrated aluminum silicate. Reinforcing agent for natural, synthetic and reclaimed rubber.
NEW ENGLAND AGENTS • WAREHOUSE STOCKS:
BERLOW AND SCHLOSSER CO.
401 Industrial Trust Bldg. Providence 3, R. I.

WORTH OPEN COLLARS SAVE TIME, CUT COSTS

May be applied or removed from shaft for adjustment of jumbos or calender shells without removal of shaft from bearing. Eliminates costly time waste. Sturdy steel collar grips as firmly as old type round collar. Available in stock to fit 1¼", 1½" and 2" square shafts. Other sizes made on order. Send for sample.
WORTH PRODUCTS ARE WORTH MORE
WORTH PRODUCTS, INC. Bennington, Vermont, U.S.A.

HOWE MACHINERY CO., INC.
30 Gregory Avenue Passaic N. J.
DESIGNERS & BUILDERS
OF V BELT MANUFACTURING EQUIPMENT
Cord Latexing, expanding mandrels, automatic cutting skiving, flipping and roll drive wrapping machines
ENGINEERING FACILITIES FOR SPECIAL EQUIPMENT
Call or Write

Carey
MAGNESIA
Oxides and Carbonates Light and Heavy—Tech. and U. S. P. Quality
Have you considered the advantages of Carey Pelletized Oxide of Magnesia packed in Polyethylene Bags—comparatively dust-free, with greater activity, longer package life?
THE PHILIP CAREY MFG. COMPANY
CINCINNATI 15, OHIO
Offices and Distributors in all Principal Cities

EQUIPMENT FOR SALE—Continued

Hydraulic presses and pumps rebuilt, repaired. New presses from laboratory up to 1000 tons. Pumping units up to 10,000 p.s.i., all capacities. CLIFTON HYDRAULIC PRESS CO., 290 Alwood Rd., Clifton, New Jersey.

BAKER PERKINS #14—JEM Universal Mixer, double shaft sigma blades, jacketed shell, vacuum cover, hydraulic tilt; Stokes Rotary Pellet Pressure—RD-3 and RDS-3; Kux Model 25; Ball & Jewell Stainless Steel Rotary Cutter #1½; Mikro Pulverizers #1-SH, #1-SI, #2-TH, #2-SI. Large stock steel and stainless steel tanks and kettles. PERRY EQUIPMENT CORP., 1409 N. 6th Street, Philadelphia 22, Penna.

SAVE WITH GUARANTEED REBUILT EQUIPMENT: 2 New R. D. Wood 500-ton EMBOSSING PRESSES, 54″ x 26″ platen. HYDRAULIC PRESSES: 42″x37″, 20″ ram, 475 tons; 2—7 opening 27″x27″, 18″ ram, 565 tons; 24″x24″, 12″ ram, 170 tons; 24″x20″, 10″ ram, 118 tons; 20″x20″, 10″ ram, 118 tons; 20″x20″, 10″ ram, 200 tons; 30″x20″, 8″ ram, 75 tons; 24″x20″, 8″ ram, 75 tons; 14″x14″, 8″ rams, 75 tons; 15″x15″, 8″ ram, 75 tons; 2—19″x24″, 10″ rams, 78 tons; 12″x12″, 6½″ ram, 50 tons; 14″x14″, 8″ ram, 50 tons; 8″x9½″, 4½″ rams, 20 tons; 16″x16″, 3½″ rams, 12 tons; PREFORM PRESS: Colton 5½ T, Reeves Drive and Motor; LABORATORY PRESSES: Carver & Watson Stillman Units; NEW UNIVERSAL DUAL PUMPING UNITS: 3—15 HP; NEW LABORATORY MILLS and CALENDERS; EXTRUDER; Modern Plastic 1½″; ACCUMULATOR: HPM 6″ ram, 2500#, also Mixers, Vulcanizers, Injection Molding Machines, etc. UNIVERSAL HYDRAULIC MACHINERY CO., INC., 285 Hudson Street, New York 13, N. Y.

GUARANTEED
REBUILT MACHINERY
MILLS, CALENDERS, TUBERS, VULCANIZERS, PUMPS, ACCUMULATORS, MIXERS, PULVERIZERS, HYDRAULIC PRESSES, CUTTING MACHINES
Immediate Deliveries from Stock

UNITED RUBBER MACHINERY EXCHANGE

183-189 ORATION STREET
NEWARK 4, N. J.
CABLE: "URME"

FOR your RUBBER PROCESSING MACHINERY NEEDS

BUYS OF THE MONTH ★

HYDRAULIC PRESSES · MILLS
CALENDERS · BALE CUTTERS
VULCANIZERS · CHOPPERS
BANBURY MIXERS · EXTRUDERS

As well as all miscellaneous equipment necessary to the processing of rubber.

ARMACO

AKRON RUBBER MACHINERY CO., INC.
200 South Forge St. · P. O. Box 88 · Akron 9, Ohio · PHONE HEmlock 9141

USED MACHINERY FOR SALE

1—Ambaco Model 3A Continuous Baler.
2—Thropp 2-roll Rubber Mills, 18″x50″.
1—Link-Belt Steel Roto Louvre Dryer, Size 7½′x20′.
1—Adamson Vulcanizer, 2′ x 12′ with quick opening door.
2—Devine vacuum Shelf Dryers—12 Shelves.
1—Paul O. Abbe #2 Master Rotary Cutter with Ball Bearings.
1—Welding Engr. Stainless Steel #2 Extruder.
14—Baker Perkins Steel Jacketed Mixers 100 gals. type 15 JIM 2. Late Type Construction.
1—Baker Perkins Stainless Steel double arm jacketed mixer, sigma blade, 9 gal.

WE ARE INTERESTED IN PURCHASING ALL TYPES OF RUBBER machinery consisting of mills, Banbury mixers, extruders, calenders, vulcanizers etc. and also complete plants.

R. GELB & SONS Inc.
STATE HIGHWAY No. 29, UNION, N.J.
UNIONVILLE-2-4900

RUBBER & PLASTIC MACHINERY
New and Used to Your Requirements
1—new 24″ x 24″ 2-opening press, 18″ ram; Model LP-O-150 Scott Tester; Special extrusion slug cutter; 36″ and 57″ Ferriot cutters; 36″ mill, completely rebuilt; 40″ and 48″ mills, complete, to be rebuilt; 2-roll calender, 18″ x 42″; Several extruders.
Factory Representatives for Harris Quick-Opening Vulcanizer Doors
SUAM RUBBER MACHINERY CO.
P. O. Box 529 — Akron 9, Ohio

GOOD USED MACHINERY "Our 37th Year"

1—Farrel-Birmingham 32″ x 92″ inverted-L 4-roll calender, reduction drive, D. C. varispeed motor.
1—Farrel-Birmingham 24″ x 84″ mill, water cooled bearings, reduction drive & 240 H. P., A. C. motor.
1—National Erie 8″ x 24″ 2-roll mill, 10 H. P. motor.
1—Royle #4 extruder, motor driven.
1—Stewart Bolling 8″ x 16″ 3-roll calender, 20 H. P. motor.
1—National Erie 8″ strainer, 75 H. P. motor.
1—Farrel-Birmingham 6″ x 13″ self-contained 3-roll calender, m.d.
1—6″ x 12″ laboratory mill, m. d.
2—Ball & Jewell #2 rotary cutters; 1—#1; 1, with 3 H. P. motor.
3—#28 Devine Vacuum shelf dryers, 19—59″ x 78″ shelves, complete.

Also other sizes Hydraulic Presses, Tubers, Banbury Mixers, Mills, Vulcanizers, Calenders, Pellet Presses, Cutters.

WIRE—PHONE—WRITE *us your inquiries*
CONSOLIDATED PRODUCTS COMPANY, INC.
70 Bloomfield St., Hoboken, N.J.
Hoboken 3-4425 — N. Y. Tel: BArclay 7-0600
WANTED: Your Surplus Rubber Machinery

NEW and REBUILT MACHINERY
SINCE 1891
L. ALBERT & SON
Trenton, N. J. · Akron, O. · Chicago, Ill. · Los Angeles, Calif.

WILLIAM TAPPER
USED RUBBER WORKING MACHINERY
Calenders:
6″ x 16″—5-roll • 18″ x 48″—4-roll • 18″ x 52″—3-roll
36″ x 14′ Pot Heaters • 45″ Twin McNeil Tire Presses • 36″ NRM Slitter
16″ x 48″ mills • 6″ x 12″ lab mills—new • 72″ HD mill
30 South Broadway, Yonkers, N. Y.
PHONE: YONKERS 3-7455
CABLE: WILTAPPER YONKERS, N. Y.

INDEX TO ADVERTISERS

A

ABC Rubber Co. 999
Accurate Steel Rule Die Manufacturers 843
Ace Machine and Mould Company ..... —
Adamson United Co. 878, 879
Adhesive Products Corp. ..... —
Aetna-Standard Engineering Co. 890, 891
A. K. Rubber Products Co. 999
Akron Equipment Co. ..... —
Akron Rubber Machinery Co. 1002
Akron Standard Mold Co. 883
Albert, L., & Son 1002
Alco Oil & Chemical Corp. 975
Aluminum Flake Co 1001
American Cyanamid Co.
Intermediate & Rubber Chemicals Dept. 881
Pigment Division ..... —
American Polymer Corp. ..... —
American Resinous Chemicals Corp. 968
Amercan Zinc Sales Company 867
B. C. Ames Co. 980
Archer • Daniels • Midland Company ..... —
Argus Chemical Laboratory ..... —
Atlas Electric Devices Co. 970

B

Baldwin-Lima-Hamilton Corp. ..... —
Bee Mold & Die, Inc. ..... —
Bestread Products Co. 999
Binney & Smith Co. ..... Insert Following 946
Black Rock Mfg. Co. ..... —
Bolling, Stewart, & Company, Inc. ..... —
Bonwitt, Eric. ..... —
Bridgwater Machine Co., The 847
Brockton Cutting & Die Machine Co. ..... —
Brookfield Engineering Labs., Inc. 969
Brooklyn Color Works, Inc. 1001

C

Cabot, Godfrey L., Inc. 887, 893
Cambridge Instrument Co. Inc. ..... —
Carey, Philip, Mfg. Co. 1001
Carter Bell Mfg. Co. 876
Century Products Co. 1000
CLASSIFIED
ADVERTISING 997, 998, 999, 1001, 1002, 1003
Cleveland Liner & Mfg. Co. 858
Colledge, E. W., General Sales Agent, Inc. 982
Columbia-Southern Chemical Corp. 877
Columbian Carbon Co. ..... Insert following 946
Concord Mica Corp. ..... —
Consolidated Products Co. 1002
CONSULTANTS SECTION 1000
Continental Carbon Co. 848, 849
Coulter, James, Machine Co. 972
Cumberland Engineering Co., Inc. 967

D

D. P. R. Inc. 969
Dayton Rubber Co. 977
Diamond Alkali Company
Pure Calcium Prod. Div. 892
Diamond Metal Products Co. ..... —
Dow Corning Corp. 864
du Pont de Nemours, E. I. & Co., Inc.
Rubber Chemicals Div. ..... Second Cover

E

Elm City Rubber Co. ..... —
Emery Industries, Inc. ..... —
English Mica Co ..... —
Erie Engine & Mfg. Co. 979
Erie Foundry Company ..... —

F

Farrel-Birmingham Co., Inc. 862, 863, 998
Ferry Machine Co., Inc. 985
Fidelity Machine Co., Inc. 1000
Flexo Supply Co. ..... —
Flightex Fabrics, Inc. ..... —
Frank, Jacobus F. ..... —

G

Gammeter, W. F., Co. 1000
Gelb, R. & Sons, Inc. 1002
General Aniline & Film Corp. 855
General Atlas Division of Cabot Carbon Co. ..... —
General Latex & Chemical Corp. ..... —
General Mills
Chemical Division 842
General Tire & Rubber Co. ..... —
Genseke Brothers 882
Gidley, Philip Tucker 1000
Glidden Co.
Chemicals-Pigments-Metals Div. 865
Goodman, G. F. & Son ..... —
Goodrich, B. F., Chemical Co. 837
Goodyear Tire & Rubber Co.
Chemical Div 840, 841, 845

H

Hadley Bros.-Uhl Co. ..... —
Hale & Kullgren, Inc. 890, 891, 1000
Hall C. P. Co. 844, 985
W. C. Hardesty Co., Inc. 866
Harris, Tedd Co. 971
Harwick Standard Chemical Co. ..... Back Cover
Harshaw Chemical Co. ..... —
Hercules Powder Company, Inc. ..... —
Heveatex Corporation 991
Hoagson & Pettis Mfg. Co. 983
Holliston Mills, Inc. 971
Holmes, Stanley H., Co. 859
Howe Machinery Co., Inc. 1001
Huber, J. M., Corp. 894
Hunt, Rodney, Machine Co. 973

I

Independent Die & Supply Co. ..... —
Indoil Chemical Co. 857
Industrial Ovens, Inc. 1000
Industrial Research Laboratories 982
Injection Molders Supply Co. ..... —
Interstate Welding Service 894

J

Johnson Steel & Wire Co., Inc. 876

K

K. B. C. Industries, Inc. 999
Kautschuk und Gummi ..... —
Koppers Co., Inc 981

L

La Goma ..... —
Lambert E. P., Co. 985
Liquid Carbonic Corp. 886

M

Mapico Color Div., Columbian Carbon Co. 966
Marbon Corp 838, 860
Marine Magnesium Products, Division of
Merck & Co., Inc. ..... —
Maryland Cork Company, Inc. 999
Monsanto Chemical Co. ..... —
Mt. Vernon-Woodberry Mills, Inc. 889
Muehlstein, H., & Co., Inc. 963
Mumper, James F., Co. 1000

N

National Chemical & Plastics Co. 971
National Roll & Foundry Co. 978
National Rosin Oil Products, Inc. 1001
National Sherardizing & Machine Co. 999
National Standard Co. 856
Naugatuck Chemical Division
U. S. Rubber Co 898
Neville Chemical Co. 895
New Jersey Zinc Co. 852

O

Oakes Corporation, E. T. ..... —
Ohio-Apex Div., F.M.&C. Corp. ..... —
Olin, R. R., Laboratories 1000
Oronite Chemical Co. 870

P

Pan American-Chemicals Division 977
M. W. Parsons-Plymouth, Inc. ..... —
Pasadena Hydraulics, Inc. 987
Pennsylvania Industrial Chemical Corp. ..... —
Pequanoc Rubber Co. 999
Phillips Chemical Co. ..... Insert following 870
Pike, S. J., & Co., Inc. ..... —
Pittsburgh Coke & Chemical Co. ..... —
Preventive Maintenance Co. 980
Progressive Service Co. 989

R

Rand Rubber Co., Inc. 999
Randall, Frank E., Co. 987
Rare Metal Products Co. 1000
Richardson, Sid, Carbon Co. 1004
Rotex Rubber Company, Inc. ..... —
Royle, John, & Sons 987
Rubba, Inc. 975
Rubber Corp. of America 983

S

St. Joseph Lead Co. 850
Saniseal Mfg. Co ..... —
Schulman, A., Inc. ..... Inside Back Cover
Scott Testers, Inc. 974
Sharples Chemicals Inc. ..... —
Shaw, Francis & Co., Ltd. 875
Shiraishi Kogyo Kaisha, Ltd. 998
Siempelkamp, G. & Co. ..... —
Simplex Cloth Cutting Machine Co., Inc. ..... —
Sivon Manufacturing Co. 991
Skelly Oil Co., Solvents Div. ..... —
Snell, Foster D., Inc. 997
South Florida Test Service 1000
Southeastern Clay Co. ..... —
Southern Clays, Inc. 868
Spadone Machine Co. ..... —
Stamford Rubber Supply Co. 969
Stanley Electric Tool Div. 989
Stauffer Chemical Co. 885
Sticht Co. Inc., Herman H. 981
Stoner's Ink Co. 1003
Suam Rubber Machinery Co. 1002
Sun Oil Co. 965

T

Taber Instrument Corp. 976
Tanney-Costello Inc. ..... —
Tapper, Wm. 1002
Taylor Instrument Companies ..... —
Tayor-Stiles and Co. ..... —
Thiokol Chemical Corp. 846
Thomaston Mills 981
Titanium Pigment Corp. 888
Trade News Service 998
Tumpeer Chemical Co. 975
Turner Halsey Co. ..... —

U

United Carbon Co. ..... Insert Following 852
United Clay Mines Corp. 1003
United Engineering & Foundry Co. 861
United Rubber Machinery Exchange 1002
U. S. Rubber Reclaiming Co. 880
Utility Mfg. Co 991

V

Vanderbilt R. T., Co. ..... Front Cover
Velsicol Corp. ..... —

W

Watson-Standard Co. ..... —
Wellington Sears Co. 884
Western Supplies Co. ..... —
White, J. J. Products Co., Inc. 989
Whittaker, Clark & Daniels, Inc. 977
Williams, C. K., & Co. ..... —
Williams Toxicology Lab. 1000
Witco Chemical Co. 948, 949
Woloch, George, Co. ..... —
Wood, R. D., Co. 839
Worth Products, Inc. 1001

MOLD LUBRICANT SPECIALTIES

#980 Silicone-Base
(ph 10.3)

#935 Silicone-Base. Excellent for high styrene resin and other rubber compounds. Lasting high gloss finish.

#735 Water miscible. Fast release, good finish, particularly effective on flat goods in eliminating pock marks.

#880 (ph 10.6)

STONER'S INK COMPANY
QUARRYVILLE, PENNA.

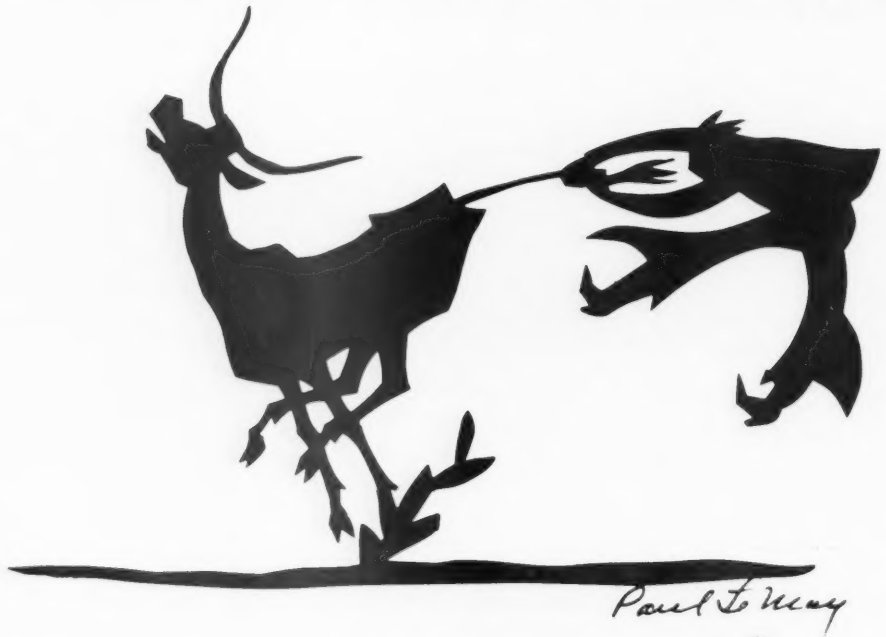
"WINDSOR CLAY"

The Ideal
HARD RUBBER CLAY

A Sample and Technical Data are yours for the asking.

UNITED CLAY MINES
CORPORATION
TRENTON NEW JERSEY

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.



... by the tail

You may have a serious problem by the tail if you fail to arrange for future adequate supplies of top-quality channel black.

The customers of the Sid Richardson Carbon Co. have no cause for worry about diversion of gas from channel plants to pipe lines. Our own nearby resources and extensive production facilities assure you a *continuing supply* of highest quality, economical-to-use ***TEXAS "E"*** and ***TEXAS "M"*** channel blacks for your present and your future requirements.

TEXAS
CHANNEL BLACKS

Sid Richardson
CARBON CO.

FORT WORTH, TEXAS

GENERAL SALES OFFICES
EVANS SAVINGS AND LOAN BUILDING
AKRON 8, OHIO

New York City
53 East 34th St.
Murray Hill 5-8388

Akron, Ohio
790 E. Tallmadge
HEmlock 4-4124

Boston, Mass.
738 Statler Bldg.
LIberty 2-2717

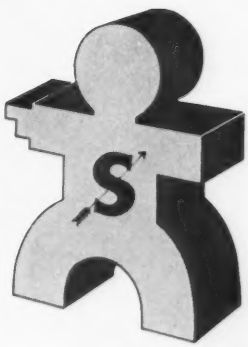
E. St. Louis, Ill.
14th & Converse
BRidge 5326

A. Schulman, Inc., Ltd.
Ibex House Minories
LONDON E. C. 3,
ENGLAND
Telephone: Royal 4989

A. Schulman (USA) GmbH
Bolco Building
Hinuberstrasse 18
HANOVER, GERMANY
Telephone: 21551

scrap rubber

plastics



crude rubber

hard rubber dust

A. Schulman Inc.

our 25th year

Assuring Precision Results..

in RUBBER and PLASTICS

PLASTICIZERS...

*POLYCIZER 332 — Dioctyl Adipate
*POLYCIZER 162 — Dioctyl Phthalate
Butyl Oleate
Dicapryl Phthalate — Odorless.
High-Purity
Dibutyl Phthalate
Didecyl Phthalate
Dioctyl Sebacate
Dibutyl Sebacate

*PLASTICIZER SC
*CELLUFLEX 112 — Diphenyl Cresyl Phosphate
*LINDOL — Tricresyl Phosphates from Coal Tar Cresylic Acid
*CELLUFLEX 179-C — Tricresyl Phosphates from Petroleum Cresylic Acid
*Reg. U.S. Pat. Off.
Also a Complete Line of Softeners.

COLORS...

STANTONE MBS (Masterbatch)
STANTONE GPE — Ground Polyethylene
STANTONE PC — Paste
STANTONE Dry Pigment

STANTONE PVC — Polyvinyl Chloride
STANTONE RP — Vinyl Inks
STANTONE Rubber and Balloon Inks
STANTONE PDS — Powder Dispersed

STABILIZERS...

STABELAN E — Paste — For excellent heat and light stability and long outdoor aging in Polyvinyl Chlorides and their copolymers
STABELAN GI — Paste — For harsh heat treatments. Protection for organic reds
STABELAN XL — Powder — Non-Toxic for food packaging
STABELAN HR — Paste — A "single package" stabilizer containing Cadmium and Barium components and synergized chelating agent
STABELAN HR — Liquid — a synergized chelating agent
STABELAN HR — Powder — a metal bearing component of Stabelan HR paste

Write for complete data on these materials.

HARWICK STANDARD CHEMICAL CO.
AKRON, BOSTON, TRENTON, CHICAGO, LOS ANGELES

38th Year

APRIL, 1954

RUBBER AGE

Compound for Quality

with

VANSTAYS

VINYL RESIN STABILIZERS

VANSTAY L

Prevents Discoloration and
Deterioration Due to
Light Exposure.

VANSTAY HT and S

Use This Combination for
Maximum Heat Protection
in Process and in Service.

See the April Vanderbilt News for Information

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.